Consumables and Accessories 2002 Catalog

e-ssentials™ – critical supplies for your analytical instrument

- Atomic Absorption
- Inductively Coupled Plasma – OES and MS
- Liquid Chromatography
- Gas Chromatography
- UV Visible, Fluorescence, and Polarimetry
- Thermal and Elemental Analysis
- Infrared Spectroscopy

PerkinElmer™
instruments.

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Before returning any item to PerkinElmer, please obtain a Return Authorization Number from a customer service representative. Call toll free **1-800-762-4000** in the U.S. or **1-800-561-4646** in Canada. Please have the following information ready:

1. Our Order Number or your Purchase Order Number.
2. The PerkinElmer part numbers of the items that you wish to return.
3. Reason for return.

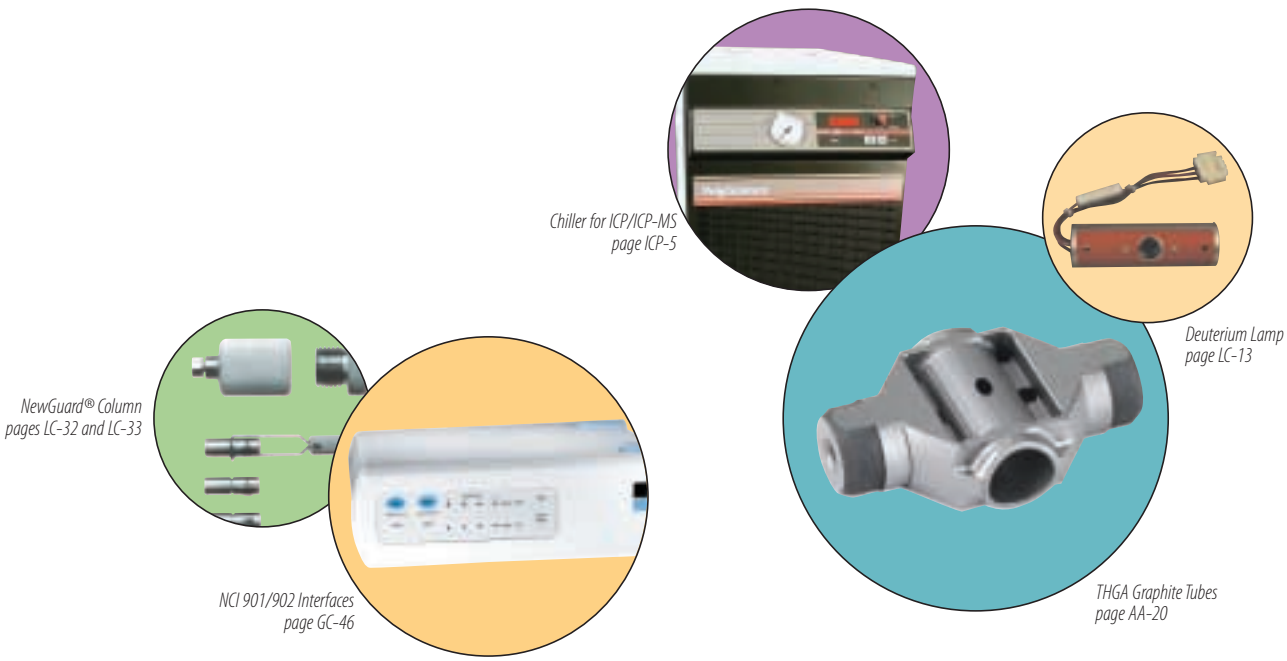
Our customer service representative will provide you with an RMA number and the return address. We cannot accept any returns without an RMA number.

TECHNICAL SUPPORT

Call toll free **1-800-762-4000** in the U.S. or **1-800-561-4646** in Canada. 8:30 a.m. to 5:00 p.m. EST.

OUTSIDE THE U.S. & CANADA

Contact your local sales office. A full list of Worldwide Support numbers follows the Table of Contents.



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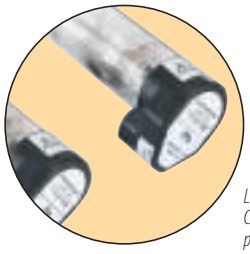

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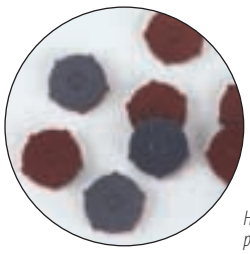

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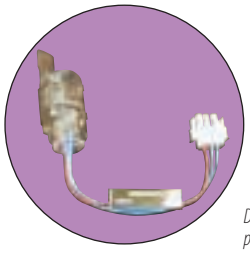

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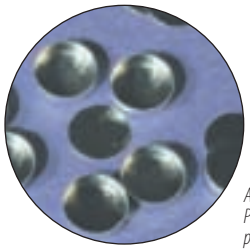

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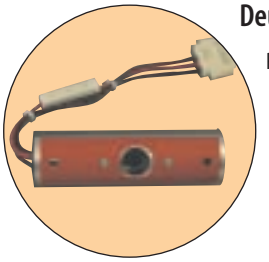
For over 25 years, PerkinElmer has designed, manufactured, and supported a full line of HPLC instruments and accessories. The Series 200 Autosampler delivers flexibility, reliability, and ease-of-use that exceeds those found in other standard autosamplers. Add the Series 200 Autosampler to any HPLC system. Its compact, stackable, and well-executed engineering design provides extraordinary precision and the most reliable automation to your laboratory.

Series 200 QA/QC System

Top-selling e-ssentials for…

Liquid Chromatography

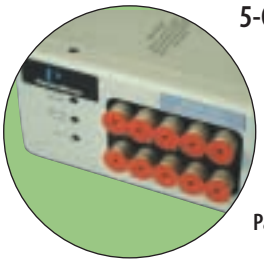


Deuterium Lamp

PerkinElmer Deuterium Lamps, for the Series 200 UV/Vis Detector, provide outstanding performance and lamp life. Lamp changes are quick and easy due to a unique, self-aligning lamp mount.

Part No. N2920149

LC-13

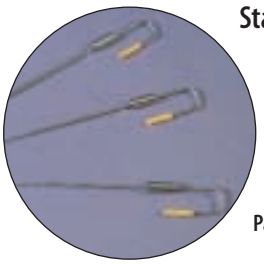


5-Channel Vacuum Degassing Package

Extend the performance of your pumps by using a solvent degassing system. The package includes a vacuum degasser, two 1 L bottles with caps, two 2 L bottles with caps, solvent tray and organizer (degasser only shown). See page LC-12 for a complete selection.

Part No. N2600508

LC-12

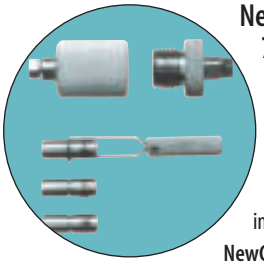


Stainless Steel Injector Needle

Ensure the maximum precision and accuracy of your analysis with genuine PerkinElmer spare parts. These replacement parts are identical to the components contained in your Series 200 Autosampler at the time of purchase. See page LC-3 for our full selection of needles and syringes.

Part No. N2930023

LC-3

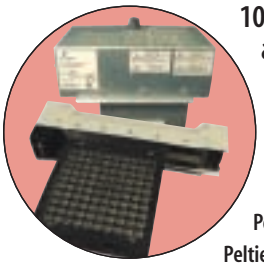


NewGuard® Column – RP-18, Aquapore ODS, 7 µm Spherical and NewGuard Holder

NewGuard cartridges prolong column life two to five fold by eliminating particulates, contaminants, and strongly bound sample components. They act as replaceable, disposable heads of your analytical columns. NewGuards are available in a convenient three-pack.

NewGuard Column Part No. 07110092
NewGuard Holder Part No. 07150001

LC-32 to LC-33



100-Position Peltier Tray and Peltier Controller

Ensure complete sample integrity with the Peltier Tray for the Series 200 Autosampler. Holds 100 2.0 mL vials which can then be cooled or heated. See page LC-1 for our full line of trays and plates.

Peltier Tray Part No. N2930035
Peltier Controller Part No. N2930036

LC-1

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Series 200 Autosampler

PerkinElmer has researched, engineered, and developed the Series 200 Autosampler to ensure precision, flexibility, reliability, and ease-of-use.

Our unique XYZ design allows you to take advantage of the built-in "extra" capabilities including dilution, derivatization, and standard addition – all without additional hardware or cost.

If you need high throughput and high speed, the Series 200 is designed for injecting up to 225 samples at rates as fast as two to three injections per minute from any sample position – ideal for LC/MS work. The Series 200 even supports direct injections from microtiter plates – shallow or deepwell format.

100-position Peltier Tray and Controller

Sample Trays

100-position Sample Tray
Part No. N2931097

205-position Sample Tray
Microvials/10 standard vials.
Part No. N2930042

225-position Sample Tray
Microvials/high throughput.
Part No. N2930043

25-position Sample Tray
Part No. N2930040

85-position Sample Tray
Derivatization
Part No. N2930041

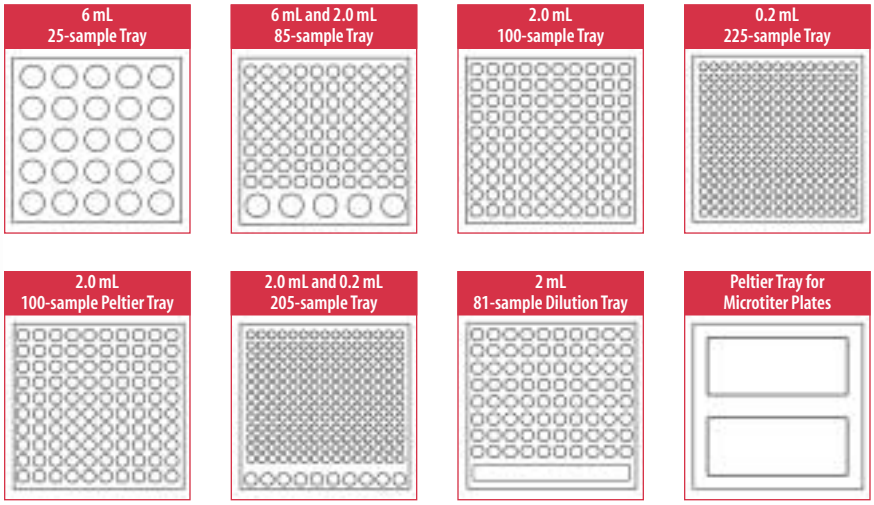
80-position Sample Tray
Dilution (with tank).
Includes: N2930044 – 80-position Tray Only
B0505677 – Glass Diluent Tank Only
Part No. N2930314

100-position Peltier Tray
Holds 2.0 mL vials. Requires Peltier Controller (N2930036).
Part No. N2930035

Series 200 Autosampler Trays and Plates

Tray Description	Autosampler Tray Part No.	Microtiter Plates Description	Microtiter Plate Part No.
Double Shallow Microtiter Plate Tray (Holds two 96-well plates)	N2930146	96-well Shallow (200 µL) 96-well Mid (500 µL) 96-well Plate Cover/Mat	N9302562 N9302561 N9302563
Double Deep Microtiter Tray (Holds two 96-well plates)	N2930147	96-well Deep (1mL) 96-well Plate Cover/Mat	N9302560 N9302563
Double Microtiter Peltier Tray Requires Peltier Controller (N2930036). (Holds two 96-well plates)	N2930037	96-well Shallow (200 µL) 96-well Mid (500 µL) 96-well Plate Cover/Mat	N9302562 N9302561 N9302563
Peltier Tray for 384-well Microtiter Plates Requires Peltier Controller (N2930036) and Series 200 Autosampler Firmware 1.08 or higher.	N2930038	384-well Plate (100 µL) 384-well Plate Cover/Mat	N9302564 N9302565

Series 200 Autosampler Trays for Glass Vials



LC Autosampler Supplies

Autosampler Vials and Caps

1.800.762.4000 US

PerkinElmer Autosampler vials are guaranteed for fit and compatibility with the Series 200 Autosampler. Both vials and caps are totally inert to samples ordinarily analyzed by Liquid Chromatography.

2.0 mL Analytical Vials, Caps, and Septa

Vials for Crimp-top

Amber glass standard vials, 2.0 mL, 11 mm o.d. top.

Part No. **N9301385 (pkg. 100)**

Clear glass standard vials, 2.0 mL, 11 mm o.d. top.

Part No. **N9302680 (pkg. 100)**

Screw Top Vials Wide Mouth

Type 1 borosilicate standard glass vials, 2.0 mL, 12 x 32 mm.

Part No. **N9306053 (pkg. 100 – clear)**

Part No. **N9306057 (pkg. 100 – amber)**

Caps/Septa

Green aluminum crimp-top cap with Teflon®/rubber septum – for 11 mm vials.

Part No. **N9302684 (pkg. 100)**

Red aluminum crimp-top cap with Teflon/rubber septum – for 11 mm vials.

Part No. **N9302685 (pkg. 100)**

Blue aluminum crimp-top cap with Teflon/rubber septum – for 11 mm vials.

Part No. **N9302686 (pkg. 100)**

Silver crimp-top cap with Teflon/rubber septa – for 11 mm vials.

Part No. **N9306015 (pkg. 100)**

Screw-top caps with single slit PTFE white silicone septa for use with 12 x 32 mm screw-top vials (N9306053).

Part No. **N9306052 (pkg. 100)**

Vial, Cap, and Sample Tray Compatibility – Series 200 Autosampler

Volume	Vial Part No.	Cap Part No.	Series 200 Tray
2.0 mL – Screw Top	N9306053	N9306052	81-position 85-position 100-position 100-position Peltier 205-position
2.0 mL – Crimp Top	N9302680 N9301385	N9302684 N9302685 N9302686 N9306015	81-position 85-position 100-position 105-position Peltier 205-position
0.2 mL (Requires N9307027 sleeves)	N9302136	N9302141	205- and 225-position
6.0 mL	N9302134	N9302143	25- and 85-position

0.2 mL Micro Vials, Caps, and Septa

Vials

Glass microVials, tapered, 0.2 mL, 8 mm o.d. top.

Part No. **N9302136 (pkg. 500)**

Caps/Septa

Polyethylene press-on cap for 8 mm o.d. vials.

Part No. **N9302141 (pkg. 1000)**

Aluminum crimp-top cap with Teflon-lined butyl rubber septa – for 8 mm vials.

Part No. **03300806 (pkg. 1000)**

6 mL Vials and Caps

Vials

Glass large-volume vials, 6.0 mL, 20 mm o.d. top.

Part No. **N9302134 (pkg. 125)**

Teflon autosampler vial sleeve.

Part No. **N9307027**

Caps/Septa

Polyethylene press-on cap for 20 mm o.d. vials.

Part No. **N9302143 (pkg. 250)**

Crimpers

PerkinElmer also provides crimpers for a variety of cap sizes. Crimp capping is still a preferred method by some laboratories to ensure sample integrity, particularly those containing volatile compounds.

Vial Crimper

For 11 mm o.d. top vials.

Part No. **00090699**

Bench Top Vial Crimper

Without jaws.

Part No. **N6621006**

Bench Top Vial Crimper Jaws

For 20 mm vials.

Part No. **N6621009**

Bench Top Vial Crimper Jaws

For 11 mm vials.

Part No. **N6621008**

Economy Cap Removal Tool

20 mm

Part No. **N9301270**

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BCD Cables

Series 200 Autosampler TotalChrom™/ Turbochrom™ BCD Cable
900 Interface.
Part No. N2930340

Series 200 Autosampler 1022 BCD Cable
REM Box.
Part No. N2930341

Syringes

Sampling Syringe
50 µL
Part No. 09923304

Sampling Syringe
100 µL
Part No. 09923305

Sampling Syringe
250 µL
Part No. 09923270

Sampling Syringe
500 µL
Part No. 09923306

Sampling Syringe
1000 µL
Part No. 09923307

Sampling Syringe
2500 µL (Requires one-time purchase of Kit N2930313.)
Part No. 09923219

2500 µL Sampling Syringe Kit
Includes: 2500 µL syringe, union, and tubing kit.
Part No. N2930313

Spare Parts

Stainless Steel Injector Needle
Part No. N2930023

Titanium Injector Needle
Part No. N2930024

Stainless Steel Sample Holding Loop
Part No. N2930311

Titanium Sample Holding Loop
Part No. N2930312

Teflon® Transfer Line Per Ft
Part No. 02506495

Delrin Nut
1/16 in.
Part No. 09920381

Tefzel Reverse Ferrule
1/16 in.
Part No. 09920382

Tefzel Union
No nuts or ferrules.
Part No. 09920391

Flush Reservoir Filter
40 µm SS
Part No. 09903615

Flush Reservoir Filter
40 µm Ti
Part No. N2600089

Needle Spring
Part No. 09920429

Needle Cartridge Thumb Screw
Part No. 09920672

Needle Cartridge Casting
Part No. N2931012

Needle Cartridge Cap Screw
Part No. N2931064

Union
1/16 in.
Part No. 09903289

Fingertight Nut
Part No. 09920513 (qty. 2)

Union Holder Arm
Part No. N2931081

Note: See the Rheodyne Valve section for injection valves spares.

Manual

User's Manual
Part No. 09938912

Autosampler Tray and Vial Cross-reference List

Series 200		ISS-200		ISS-100		Integral 4000		LC-600	
Tray	**Vial**	**Tray**	**Vial**	**Tray**	**Vial**	**Tray**	**Vial**	**Tray**	**Vial**
225-position	0.2 mL	145-position	0.2 mL	100-position	2.0 mL	100-position	2.0 mL	60-position	2.0 mL Crimp Top Only
205-position	2.0 mL and 0.2 mL	100-position	2.0 mL	85-position	6.0 mL and 2.0 mL			42-position	0.8 mL (N9301069)
100-position	2.0 mL	85-position	6.0 mL and 2.0 mL						
85-position	6.0 mL and 2.0 mL								
81-position	2.0 mL								
25-position	6.0 mL								

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LC Autosamplers

ISS-200 Autosampler

ISS-200 Sample Trays

100-position Sample Tray
Part No. B0198017

150-position Sample Tray
Part No. B0198016

ISS-200 Spares

Sampling Needle
Part No. 02540582

Dosing Pump
250 µL
Part No. B0193780

Dosing Pump
1500 µL
Part No. B0506592

Flush Pump Inlet Check Valve
Part No. B0105973

Flush Pump Outlet Check Valve
Part No. B0105974

Flush Pump Piston
Part No. B0092456

Flush Pump Piston Seal
Part No. B0170875

Flush Pump Piston Head
Part No. B0170873

Dosing (Sample) Pump Piston
250 µL
Part No. B0092468

Dosing Pump Piston Seal
250 µL
Part No. B0133956

PerkinElmer Injection Valve Assembly
With 150 µL loop.
Part No. B0185259

Teflon® Transfer Tube
Part No. 02506495

Tefzel Sample Transfer Tube
For Prep Option Kit.
Part No. B0121084

Flush Solvent Filter
With Teflon tubing, nuts, and ferrules.
Part No. B0193766

Preparative Option Kit*
Injection volumes of 1 – 1500 µL.
Part No. B0193796

Serial Dilution Tank
Part No. B0505677

Timed Events PCB
Allows six programmable contact closures.
Part No. B0185320

**Also requires purchase of B0184142 Software Option PCB. However, a single B0184142 can support up to three optional add-ons.*

ISS-200 PerkinElmer Injector Valve Parts

Needle Guide
Part No. B0185481

Rotor Seal
Part No. B0185480

Stator
Part No. B0162836

Sample Loop
10 µL
Part No. B0152476

Sample Loop
150 µL
Part No. B0152473

Sample Loop
2000 µL
Part No. B0152474

ISS-200 Manual

User's Manual
Part No. B0198180

ISS-100, LC-600 Autosamplers, Integral 4000

ISS-100 Autosampler

Sampling Needle
For units manufactured before January 1989.
Part No. 02540582

Sampling Needle
For units manufactured after January 1989.
Part No. 02540422

Sampling Needle Teflon® Front Ferrule for Needle Seal
Part No. 09920123

Sampling Needle Teflon Back Ferrule for Needle Seal
Part No. 09920124

Flush Pump Inlet Check Valve
Part No. B0105973

Flush Pump Outlet Check Valve
Part No. B0105974

Flush Pump Piston Seal
Part No. B0092449

Flush Pump Piston
Part No. B0092456

Dosing (Sample) Pump
Part No. B0193780

Dosing Pump Piston
Part No. B0092468

Dosing Pump Piston Seal
Part No. B0133956

Flush Solvent Filter
Part No. B0049642

Long Capillary Transfer Tube, 200 µL
Part No. B0121084

Tefzel Standard Sample Transfer Tube
Part No. B0118468

Integral 4000

Sample Needle Assembly
Part No. 02540581

Sample Syringe
250 µL
Part No. L5351253

Sample Syringe Teflon Nut
Part No. 04973736

Sample Syringe Teflon Ferrule
Part No. 04973737

Polyethylene Tubing
1/16 in., (located between flush pump and sampling syringe as well as between sampling syringe and needle).
Part No. 04971726

Flush Pump Inlet Check Valve
Part No. B0105973

Flush Pump Outlet Check Valve
Part No. B0105974

Flush Pump Piston
Part No. B0092456

Flush Pump Piston Seal
Part No. B0170875

Flush Solvent Filter
Part No. B0049642

Flush Pump Piston Head
Part No. B0170873

Note: See the Rheodyne Valve section on page LC-48 for injection valves spares.

LC-600 Autosampler

Sampling Needle
For units with 42-position tray.
Part No. 02542750

Sampling Needle
For units with 60-position tray.
Part No. 02542651

Note: See the Rheodyne Valve section on page LC-48 for injection valves spares.

HPLC Pumps

Series 200 Pump

Normal use of any solvent delivery system eventually will require that you replace some selected parts. Refer to the appropriate operator's manual for the recommended maintenance schedule. The use of PerkinElmer replacement parts ensures long and trouble-free performance of your solvent delivery system.

Pistons

The piston is the most critical component of the solvent delivery system. Exacting specifications are required to provide precise solvent flow. Both the high and low pressure pistons are made of sapphire, which has been chosen for the highest quality hardness and surface finish in order to prevent seal wear.

Piston Seals

The need to replace piston seals is a natural consequence of routine use. All PerkinElmer pumps contain a high and low pressure piston seal. In addition to the standard high pressure seal, which is typically used for most all applications, we provide extended performance seals for more specialized requirements. The heavy-duty, high pressure seal is composed of graphite fiber-filled Teflon® and is recommended for very high pressure and high flow rates. The chemically resistant seal is also composed of a graphite Telfon material. This seal is inert to an extended range of solvents, such as buffers. It cannot be used with high flows or pressures in excess of 3000 psi. Whenever replacing the low pressure seal, the Low Pressure Seal Back-Up Ring should also be replaced.

Check Valves

Check valves allow solvent to flow in only the desired direction. They should be cleaned or replaced periodically in accordance with a preventative maintenance schedule. Check valves, which include a sealing washer, are easy to install using the Torque Wrench kit. For all PerkinElmer pumps an intermediate check valve is required. The input check valve, which is identical, should be ordered.

Series 200 Pump

Pulse Compensators

The pulse compensator combines high-efficiency pulse smoothing with a low void volume. A Teflon diaphragm separates a reservoir filled by an RTV elatomer plug. Normal use will necessitate the eventual replacement of the diaphragm.

Series 200 Pump Solvent Upgrade Kits

The unique design of the PerkinElmer Series 200 Pump allows it to easily be upgraded for additional solvent capability right in your laboratory as your needs change. Installation of the kit by a PerkinElmer Representative is recommended but not included. Contact your local PerkinElmer Representative for more information.

Series 200 Isocratic to Binary Upgrade Kit
Part No. N2910342

Series 200 Isocratic to Quaternary Upgrade Kit
Part No. N2910343

Series 200 Binary to Quaternary Upgrade Kit
Part No. N2910344

Manuals and Accessories

Series 200 Operator's Manual
Part No. 09938910

Series 200 Pump Injector Bracket
Part No. N2910349

Pump Backpressure Regulator
To generate backpressure for applications less than 250 psi.
Part No. 02540272

Pump Priming Syringe
30 mL, plastic.
Part No. 09904849

Pump Priming Syringe
30 mL, glass.
Part No. 00879078

Stainless Steel Mixing Coil Kit
Includes: length of 1/16 in. o.d. x 0.043 in. i.d. stainless steel tubing with required nuts and ferrules.
Part No. N2600266

Titanium Mixing Coil Kit
Includes: length of 1/16 in. o.d. x 0.043 in. i.d. titanium tubing with required nuts and ferrules.
Part No. N2600274

Narrow Bore Upgrade Kit
For reducing delay volumes.
Part No. N2600304

Maintenance Kits and Tools

High Pressure Piston Seal Replacement Kit
Includes: four seals, backup rings, and O-Rings.
Part No. N2910383

Micropump Piston Seal Replacement Kit
Part No. N2910384

Biocompatible Piston Seal Replacement Kit
Includes: four seals, backup rings, and O-Rings.
Part No. N2910385

Seal Removal Tool
Part No. N2601295

Insertion Tool
Part No. N2601503

Check Valve Torque Wrench
Part No. 02540871

Series 200 Pump Maintenance Kit
Includes: fuses, seals, O-Rings, and seal tools.
Part No. N2910345

Series 200 Bio LC Pump Maintenance Kit
Includes: fuses, seals, O-Rings, and seal tools.
Part No. N2910346

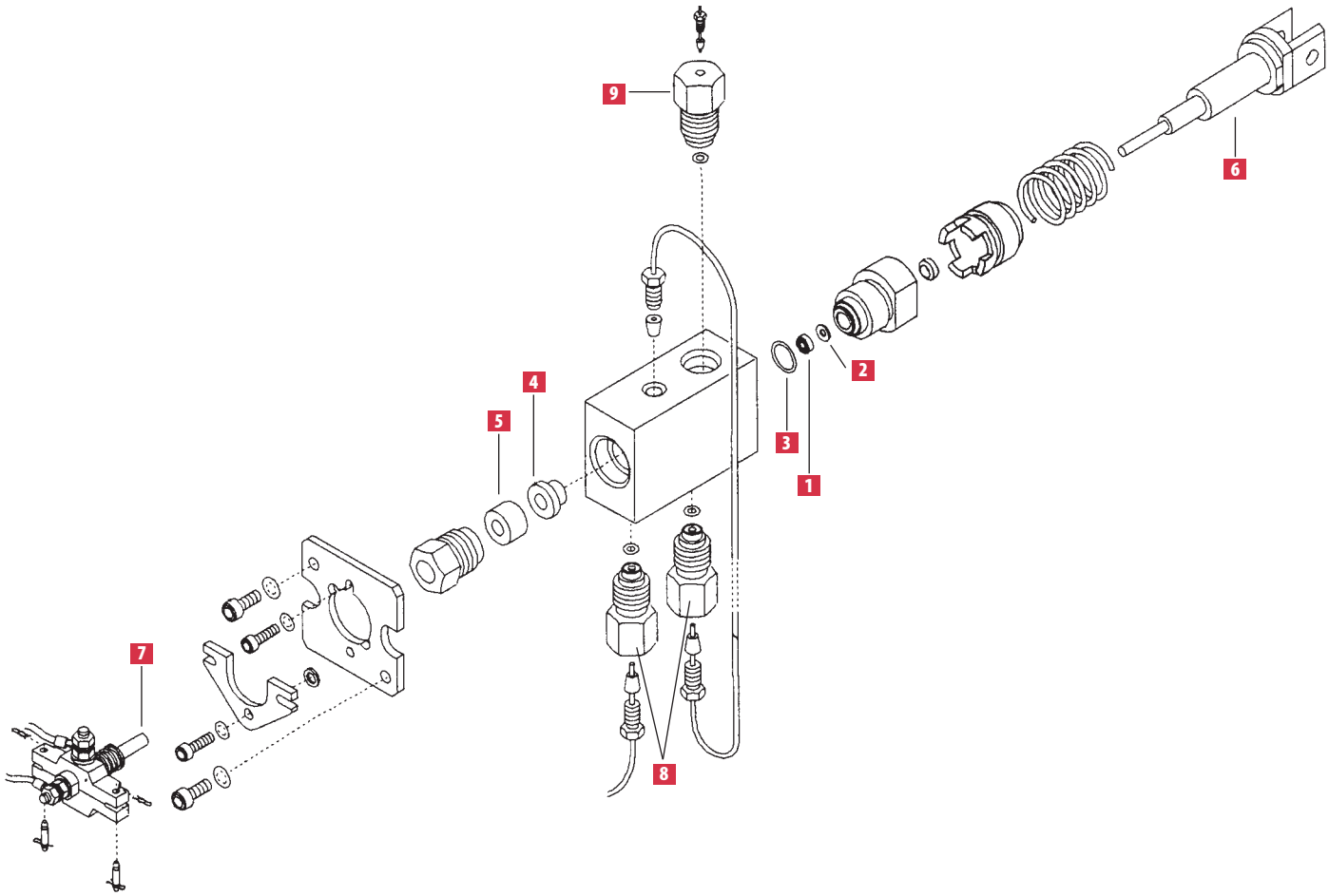
Pulse Compensator Repair Kit
Includes: diaphragm, elastomer plug, and seal.
Part No. N2600313

Diaphragm for Pulse Compensator
Part No. N2601316

Seals, Pistons, and Check Valves

	Standard Stainless Steel Part No.	Micropump Stainless Steel (Not Shown) Part No.	Biocompatible Titanium (Not Shown) Part No.
1 Standard High Pressure Piston Seal (Gold)	09907324	09907324	09907338
High Pressure Piston Seal – Chemically Resistant (Black)	09907331		
High Pressure Piston Seal – Chemically Resistant (New)	09907345		
Heavy Duty High Pressure Piston Seal	09907328		
2 High Pressure Piston Seal Backup Ring	02542076	09923367	02542076
3 High Pressure Piston Seal Backup O-Ring	09902128	09902128	09902018
4 Low Pressure Piston Seal	09907339	09923366	09907339
5 Low Pressure Piston Backup Guide Bushing	02542313		N2601174
6 High Pressure Piston	N2600124	N2910511	N2600124
7 Low Pressure Piston	N2600104	N2910512	N2600104
8 Inlet/Intermediate Check Valve	02540177	02540177	N2600226
9 Outlet Check Valve	02540197	02540197	N2600192

Refer to the user's manual for a complete illustrated parts list.



Exploded view of standard stainless steel pump head.

HPLC Pumps

Series 410 Pump

Seal Kits

High Pressure Piston Seal Replacement Kit
Includes: four seals, backup rings, and O-Rings.
Part No. 02540275

Biocompatible Piston Seal Replacement Kit
Includes: four seals, backup rings, and O-Rings.
Part No. N2600061

Manuals and Accessories

Series 410 Operator's Manual
Part No. 09937082

Pump Backpressure Regulator
To generate backpressure for applications less than 250 psi.
Part No. 02540272

Pump Priming Syringe
30 mL, plastic.
Part No. 09904849

Pump Priming Syringe
30 mL, glass.
Part No. 00879078

Stainless Steel Mixing Coil Kit
Includes: length of 1/16 in. o.d. x 0.043 in. i.d. stainless steel tubing with required nuts and ferrules.
Part No. N2600266

Titanium Mixing Coil Kit
Includes: length of 1/16 in. o.d. x 0.043 in. i.d. titanium tubing with required nuts and ferrules.
Part No. N2600274

Narrow Bore Upgrade Kit
For reducing delay volumes.
Part No. N2600304

Maintenance Tools

Seal Removal Tool
Part No. N2601295

Insertion Tool
Part No. N2601503

Check Valve Torque Wrench
Part No. 02540871

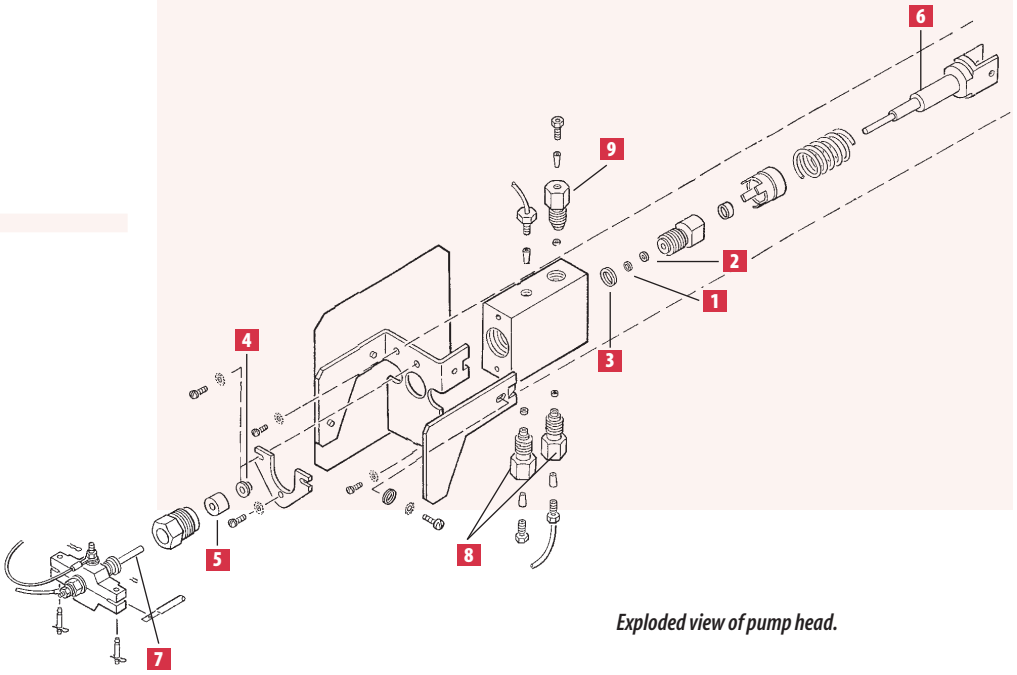
Pulse Compensator Parts

Pulse Compensator Repair Kit
Includes: diaphragm, elastomer plug, and seal.
Part No. N2600313

Diaphragm for Pulse Compensator
Part No. N2601316

Seals, Pistons, and Check Valves

	Standard Stainless Steel Part No.	Biocompatible Titanium (Not Shown) Part No.
1 Standard High Pressure Piston Seal (Gold)	09907324	09907338
High Pressure Piston Seal – Chemically Resistant (Black)	09907331	
High Pressure Piston Seal – Chemically Resistant (New)	09907345	
Heavy Duty High Pressure Piston Seal	09907328	
2 High Pressure Piston Seal Backup Ring	02542076	02542076
3 High Pressure Piston Seal Backup O-Ring	09902128	09902018
4 Low Pressure Piston Seal	09907339	09907339
5 Low Pressure Piston Backup Guide Bushing	02542313	N2601174
6 High Pressure Piston –		
units built after December 1989	N2600124	N2600124
units built before December 1989	02540176	02540176
7 Low Pressure Piston –		
units built after December 1989	N2600104	N2600104
units built before December 1989	02542149	02542149
8 Inlet/Intermediate Check Valve –		
units built after March 1, 1987	N2600226	N2600226
units built before March 1, 1987	N2600191	N2600191
9 Outlet Check Valve	02540197	N2600192



Exploded view of pump head.

Seal Kits

High Pressure Piston Seal Replacement Kit
Includes: four seals, backup rings, and O-Rings.
Part No. 02540275

Biocompatible Piston Seal Replacement Kit
Includes: four seals, backup rings, and O-Rings.
Part No. N2600061

Seals

1 **Standard High Pressure Piston Seal (Gold)**
Part No. 09907324

1 **High Pressure Piston Seal – Chemically Resistant (Black)**
Part No. 09907331

1 **High Pressure Piston Seal – Chemically Resistant (New)**
Part No. 09907345

1 **Heavy Duty High Pressure Piston Seal**
Part No. 09907328

2 **High Pressure Piston Seal Backup Ring**
Part No. 02542076

3 **High Pressure Piston Seal Backup O-Ring**
Part No. 09902128

4 **Low Pressure Piston Seal**
Part No. 09907339

5 **Low Pressure Piston Backup Guide Bushing**
Part No. 02542313

Pistons

6 **High Pressure Piston**
Units built after December 1989.
Part No. N2600124
Units built before December 1989.
Part No. 02540176

7 **Low Pressure Piston**
Units built after December 1989.
Part No. N2600104
Units built before December 1989.
Part No. 02542149

Check Valves

8 **Inlet/Intermediate Check Valve**
Part No. 02540177

8 **Biocompatible Inlet/Intermediate Check Valve**
For units built before March 1, 1987.
Part No. N2600191

8 **Biocompatible Inlet/Intermediate Check Valve**
For units built after March 1, 1987.
Part No. N2600226

9 **Outlet Check Valve**
Part No. 02540197

9 **Biocompatible Outlet Check Valve**
Part No. N2600192

Pulse Compensator Parts

Pulse Compensator Repair Kit
Includes: diaphragm, elastomer plug, and seal.
Part No. N2600313

Diaphragm for Pulse Compensator
Part No. N2601316

Manuals and Accessories

Model 250 Operator's Manual
Part No. 09937169

Pump Backpressure Regulator
To generate backpressure for applications less than 250 psi.
Part No. 02540272

Pump Priming Syringe
30 mL, plastic.
Part No. 09904849

Pump Priming Syringe
30 mL, glass.
Part No. 00879078

Stainless Steel Mixing Coil Kit
Includes: length of 1/16 in. o.d. x 0.043 in. i.d. stainless steel tubing with required nuts and ferrules.
Part No. N2600266

Titanium Mixing Coil Kit
Includes: length of 1/16 in. o.d. x 0.043 in. i.d. titanium tubing with required nuts and ferrules.
Part No. N2600274

Narrow Bore Upgrade Kit
For reducing delay volumes.
Part No. N2600304

Maintenance Kit and Tools

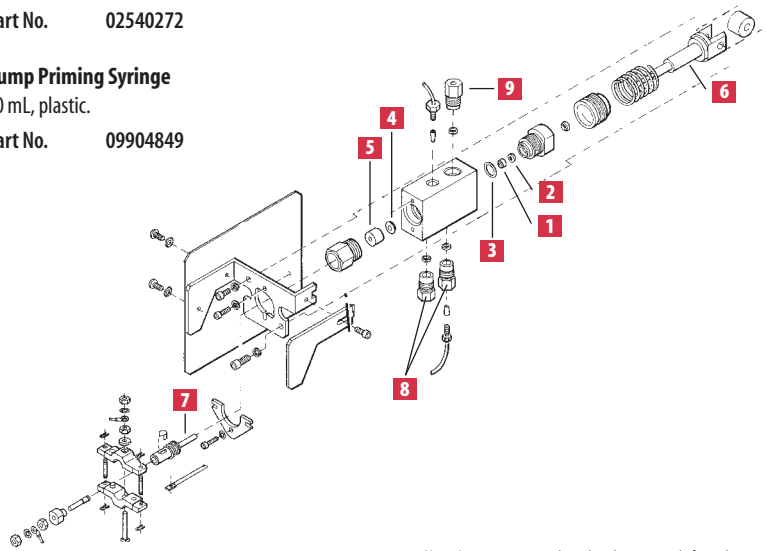
Seal Removal Tool
Part No. N2601295

Insertion Tool
Part No. N2601503

Check Valve Torque Wrench
Part No. 02540871

Model 250 Maintenance Kit
Includes: check valves, seals, and fuses.
Part No. N2600265

Pulse Compensator Repair Kit
Includes: diaphragm, elastomer plug, and seal.
Part No. N2600313



Note: Arrange piston seals so that the spring side faces the pump head.

www.perkinelmer.com/essentials

HPLC Pumps

Accessories and Spares For Other Piston Pumps

Piston Seals/O-Rings/Bushings

For use on the Series 4, Integral 4000, Model 620, and Series 400 pumps.

Standard High Pressure Piston Seal (Gold)
Part No. 09907324

High Pressure Piston Seal – Chemically Resistant (Black)
Part No. 09907331

High Pressure Piston Seal – Chemically Resistant (New)
Part No. 09907345

Heavy Duty High Pressure Piston Seal
Part No. 09907328

High Pressure Piston Seal Backup Ring
Part No. 02542076

High Pressure Piston Seal Backup O-Ring
Part No. 09902128

Low Pressure Piston Seal
Part No. 09907339

Low Pressure Piston Backup Guide Bushing
Part No. 02542313

Pump Pistons

For use on the Series 4, Integral 4000, Model 620, and Series 400 pumps.

High Pressure Piston
Part No. N2600124
Units built before December 1989.
Part No. 02540176

Low Pressure Piston
Part No. N2600104
Units built before December 1989.
Part No. 02542149

For use on the Biocompatible Integral 4000 and Model 620 pumps.

High Pressure Piston
Part No. N2600124

Low Pressure Piston
Part No. N2600104

Check Valves

For use on the Series 4, Integral 4000, Model 620, and Series 400 pumps.

Inlet/Intermediate Check Valve
Part No. 02540177

Outlet Check Valve
Part No. 02540197

For use on the Biocompatible Integral 4000 and Model 620 pumps unless otherwise noted.

Inlet/Intermediate Check Valves
Part No. N2600226

Outlet Check Valve
Part No. N2600192

Pulse Compensator Spares/Rebuild Kits

Series 4 Pulse Compensator Repair Kit
For pulse dampeners containing methanol.
Includes: diaphragm, seals, and O-Rings.
Part No. 02540347

For use on the Integral 4000 and Model 620 pumps.

Pulse Compensator Repair Kit
Includes: diaphragm, elastomer plug, and seal.
Part No. N2600313

Diaphragm for Pulse Compensator
Part No. N2601316

Pump Operators' Manuals

Series 200 Operator's Manual
Part No. 09938910

Model 250 Operator's Manual
Part No. 09937169

Series 410 Operator's Manual
Part No. 09937082

Series 4 Operator's Manual
Part No. 09939731

Accessories

Pump Backpressure Regulator
To generate backpressure for applications less than 250 psi.
Part No. 02540272

Pump Priming Syringe
30 mL, plastic.
Part No. 09904849

Pump Priming Syringe
30 mL, glass.
Part No. 00879078

Stainless Steel Mixing Coil Kit
Includes: length of 1/16 in. o.d. x 0.043 in. i.d. stainless steel tubing with required nuts and ferrules.
Part No. N2600266

Titanium Mixing Coil Kit
Includes: length of 1/16 in. o.d. x 0.043 in. i.d. titanium tubing with required nuts and ferrules.
Part No. N2600274

Narrow Bore Upgrade Kit
For Model 620 pumps.
Part No. N2600304

Pump Maintenance Tools and Maintenance Kits

For use on the Series 4, Integral 4000, Model 620, and Series 400 pumps.

Seal Removal Tool
Part No. N2601295

Insertion Tool
Part No. N2601503

Check Valve Torque Wrench
Part No. 02540871

Integral 4000 Maintenance Kit
Includes: seals, O-Rings, D2 lamp, test flow cell, replacement tools, and grease.
Part No. N2360050

Piston Seals Replacement Kits

The following kits include four seals, backup rings, and O-Rings; and can be used for the Series 4, Integral 4000, Model 620, and Series 400 pumps.

High Pressure Piston Seal Replacement Kit
Part No. 02540275

Biocompatible Piston Seal Replacement Kit
Part No. N2600061

ABI 400 Pump

Purge Valve Assembly
Part No. 29000307

Inlet Check Valve
1/8 in.
Part No. 72000060

Outlet Check Valve
1/8 in.
Part No. 72000062

Piston
Analytical
Part No. 14001970

Working Head
Analytical
Part No. 14001579

Accumulator Head
Analytical
Part No. 14001580

Piston Seal Kit
Analytical, UHMW.
Part No. 72000087

ABI 140A Syringe Pump

Syringe Set
Piston and cylinder, ceramic, 1 x 10 mL (must also order Type 1 Upgrade kit, one per syringe).
Part No. 06540046

Piston
Ceramic, 10 mL (must also order Type 1 Upgrade kit, one per syringe).
Part No. 60365000

Piston
SS 316, 10 mL.
Part No. 05550049

Ferrule
1/8 in. SS for Inlet Tubing.
Part No. 09903997

Seal Removal Kit
Part No. N1001021

Seal Kit, High Pressure
10 mL (Polyethylene).
Part No. 00401577

Seal Kit, Low Pressure
10 mL (Polyethylene).
Part No. 00401578

Seal Kit, High Pressure
10 mL (Teflon®).
Part No. 06530069 (pkg. 2)

Seal (all) and Tool Kit, Replacement
10 mL, (Polyethylene).
Part No. 06530085

ABI 140B Syringe Pump

(For pumps with Part Nos. 9111227 and below, and all alphanumeric Part Nos.):

Syringe Set
Piston and cylinder, ceramic, 1 x 10 mL (must also order Type 1 Upgrade kit, one per syringe).
Part No. 06540046

Piston
Ceramic, 10 mL (must also order Type 1 Upgrade kit, one per syringe).
Part No. 60365000

Piston
SS 316, 10 mL
Part No. 05550049

(For pumps with Part Nos. 9111228 and above):

Syringe Set
Piston and cylinder, ceramic, 1 x 10 mL.
Part No. 06540046

Piston
Ceramic, 10 mL (must also order Type 1 Upgrade kit, one per syringe).
Part No. 60365000

Piston
SS 316, 10 mL.
Part No. 05550049

(For all 140B pumps)

Dynamic Mixer
75 µL volume.
Part No. 05540110

Dynamic Mixer
200 µL volume.
Part No. 29000570

Seal Kit, High Pressure
10 mL (Polyethylene).
Part No. 00401577

Seal Kit, Low Pressure
10 mL (Polyethylene).
Part No. 00401578

Seal Kit, High Pressure
10 mL (Teflon).
Part No. 06530069 (pkg. 2)

Seal (all) and Tool Kit
Repl., 10 mL (Polyethylene).
Part No. 06530085

ABI 140C Syringe Pump

140C User's Manual
Part No. 00903078

Seal
Rear piston.
Part No. 00200239

Seal
Cylinder head.
Part No. 00200240

Piston Retaining Clip
Part No. 04030126

Tool
Piston removal.
Part No. 03920005

Cylinder Seal Extraction Tool
Part No. N1001021

Cylinder Seal Insertion Tool I
Part No. N1001022

75 µL Dynamic Mixer
Part No. 00603861

200 µL Dynamic Mixer
140C/140B (for narrowbore columns).
Part No. 29000570

Ferrule
1/8 in. SS (for inlet tubing).
Part No. 09903997

Trim Strip
Part No. 04020041

HPLC Pumps

Solvent Spargers, Filters, and Degassing Systems

On-line Vacuum Degasser Packages

Extend the performance of your pumps by using a solvent degassing system. PerkinElmer offers both traditional helium degassing and now on-line vacuum degassing accessories to cover your unique degassing requirements.

3-Channel Vacuum Degassing Package
Includes: a vacuum degasser, one 1 L bottle with cap, one 2 L bottle with cap, and an organizer and tray accessory.
Part No. N2600507

5-Channel Vacuum Degassing Package
Includes: a vacuum degasser , two 1 L bottles with caps, two 2 L bottles with caps, solvent tray, and organizer.
Part No. N2600508

Replacement Vacuum Degasser Bottles

1 L Glass Bottle
Part No. N2600497

2 L Glass Bottle
Part No. N2600498

Helium Degassing Kits

Helium degassing solvent packages are available in a choice of three solvent configurations. Each kit contains a manifold, bottles, as well as all required tubing and fittings. The helium manifold has been designed to prevent accidental over-pressurization and to eliminate the possibility of solvent migrating back into the helium supply lines. The glass bottles supplied with the kits are specially coated to ensure safety and prevent solvent leakage if accidentally dropped or otherwise broken.

Isocratic Solvent Package
Includes: one 2 L glass bottle kit, with cap assembly, and a helium manifold.
Part No. N2600491

Binary Solvent Package
Includes: one 1 L glass bottle kit and one 2 L glass bottle kit, with cap assemblies, one helium manifold, and a solvent organizer accessory.
Part No. N2600505

Quaternary Solvent Package
Includes: two 1 L glass bottle kits and two 2 L glass bottle kits, with cap assemblies, one helium manifold, and a solvent organizer accessory.
Part No. N2600506

Helium Degassing System Spares

Helium Manifold Kit
5 psi regulator.
Part No. N2600284

1 L Glass Bottle Kit
Includes: cap assembly, sparger (10 µm), solvent filter (10 µm), connecting fittings, instructions.
Part No. N2600456

2 L Glass Bottle Kit
Part No. N2600457

5 L Glass Bottle Kit
Part No. N2600458

Bottle Cap Assembly
For 1 L and 2 L glass bottles. Includes: sparger (10 µm), solvent filter (10 µm), and connecting fittings.
Part No. N2600495

Bottle Cap Assembly
For 5 L glass bottle.
Part No. N2600496

1 L Glass Bottle
Part No. N2600497

2 L Glass Bottle
Part No. N2600498

5 L Glass Bottle
Part No. N2600499

Autosampler Flush Bottle Kit
Part No. N2600459

Degassing Fittings

Tefzel Nut
1/8 in.
Part No. N2601189

Kel-F Ferrule
1/8 in.
Part No. 09903771

Helium Supply Connectors

Each Solvent Reservoir System requires high-purity helium, either to pressurize or to degas the solvents. The helium pressure regulator with shut-off valve can deliver from 5 to 180 psi of pressure from an external tank. We offer all the fittings needed to connect a helium source to your Solvent Reservoir System. Refer to your operator's manual for step-by-step installation instructions.

Regulator
5 to 180 psi with outlet shut-off valve.
Part No. 00230090

Female Connector
Reduces 1/4 in. to 1/8 in.
Part No. 09903906

Teflon Tubing
Helium and Solvent Supply, per 1 ft. length.
1/8 in. o.d. x .060 in. i.d.
Part No. 02506483

Solvent Spargers

10 µm Solvent Reservoir Sparger
Stainless steel
Part No. 09903610
Titanium
Part No. N2600070

40 µm Solvent Reservoir Sparger
Stainless steel
Part No. 09903615
Titanium
Part No. N2600089

Solvent Filters

In-line Solvent Filter System
For stainless steel pumps.
Part No. 09903606

In-line Solvent Filter Replacement Kit
For all stainless steel pumps. Includes two 0.5 µm filter elements and four seals.
Part No. 02540311

In-line Solvent Filter System, Titanium
For Biocompatible pumps.
Part No. N2600259

Replacement 2 µm Titanium Filter Element
For in-line solvent filter for Biocompatible pumps. Requires but does not include N2601262.
Part No. N2601477

Replacement Seal for In-line Solvent Filter
For Biocompatible pumps. Use with N2601477.
Part No. N2601262

Solvent Filters

1.800.561.4646 Canada

SERIES 200 UV/VIS DETECTOR

With over a decade of innovation and outstanding analytical performance to draw upon, the Series 200 UV/Vis is the successor to the industry standard UV/Vis detector; the Model 785A.

The proven dual-beam optical design yields high sensitivity even for difficult ultra-trace analysis, detecting picogram quantities of many compounds. Couple that with your choice of either a Deuterium or Tungsten source for outstanding ultraviolet *and* true visible performance anywhere in the detector's 190-700 nm wavelength range. Lamp changes are quick and easy due to a unique, self-aligning lamp mount. Choose from several easily interchangeable flowcell formats to match your specific analytical needs – including a flowcell for microbore applications.

Flexibility and ease-of-use are ensured through an optimized user interface – including an easy-to-read, multiline display, tactile keyboard, and context-sensitive function keys. Full wavelength programmability, battery-backed method storage, and linking of methods allow for automated analysis and method development activities – all without computer control! A full suite of user accessible diagnostics allow for quick troubleshooting in the unlikely event of a problem – while an integrated leak-detector sounds an audible alert and halts your analysis if a solvent leak occurs.

When single-point method control of your HPLC system is required, the Series 200 UV/Vis is fully controllable via PerkinElmer's renowned TotalChrom Workstation and TotalChrom Client/ Server platforms. The Series 200 UV/Vis features full digital output of chromatographic data, so an intermediary analog-to-digital interface is not required. This simplifies system installation and operation and reduces bench-space requirements as well.

Description	Part No.
Series 200 UV/Vis Detector, 100/120/220/240 VAC, 50/60 Hz	N2920011
Microbore Flowcell, 6 mm x 2.4 mL	29000544
Standard Flowcell	N2920117
Deuterium Lamp	N2920149
Tungsten Lamp	N2920146

Series 200 UV/Vis Detector

SERIES 200/785A UV/VIS DETECTOR ACCESSORIES

Flowcells/Flowcell Accessories

Adapter, Microbore Head
Part No. 29000152

Flowcell
Microbore (172 System, 6 mm x 2.4 µL), for 785A only.
Part No. 29000197

Flowcell
Standard Analytical (8 mm x 12 µL), for 785A only.
Part No. 29000542

Flowcell Assembly
Microbore (non-172 System, 6 mm x 2.4 µL).
Part No. 29000544

Flowcell Assembly
Prep (3 mm x 1.7 µL).
Part No. 29000545

Reference Aperture
Dry cell.
Part No. 29000078

Flowcell Adapter
For 12 µL flowcell.
Part No. 27000087

Flowcell Adapter
For 2.4 µL flowcell.
Part No. 25000376

Windows
Flowcell, Suprasil (pair).
Part No. 72000008

Flowcell Bulkhead Union
Part No. 25000323

Heat Exchange Assembly
Part No. 26000050

Manuals/Maintenance Items/Accessories

Series 200 Manual
Part No. 09936504

785A Manual
User's Manual.
Part No. 09936189

Backpressure Regulator
Adjustable from 15-59 psi, stainless steel.
Part No. 09907126

Cable Assembly
Detector Signal, for 785A only.
Part No. 60000186

Cable Assembly
Remote Autozero, for 785A only.
Part No. 60000366

Cable
785A to TotalChrom™.
Part No. 09410036

Detector Source Lamps

Deuterium Lamp
Part No. N2920149

Tungsten Lamp
Part No. N2920146

Deuterium Lamp – N2920149

www.perkinelmer.com/essentials

LC Detectors

Diode Array Detector

SERIES 200 DIODE ARRAY DETECTOR

Manuals/Maintenance Items/Accessories

Series 200 Diode Array Operator's Manual
Part No. 09938914

Backpressure Regulator
Adjustable from 15-59 psi, stainless steel.
Part No. 09907126

Sources/Lamps

Standard Deuterium Lamp (Phase 1)
Part No. N2922010

Tungsten Source
Part No. N2922011

Deuterium Lamp (Phase 2)
Part No. N2922046

Flowcells

Standard Flowcell Assembly, Stainless Steel
12.0 µL, 10.0 mm path.
Part No. N2922028

Low Volume Flowcell Assembly, Stainless Steel
5.0 µL, 4.5 mm path.
Part No. N2922030

Flowcell Assembly, PEEK
12 µL, 10 mm path.
Part No. N2922029

Warning

Replacement sources are easy to install and do not require the assistance of a PerkinElmer Representative. However, before changing the detector source, refer to your operator's manual for complete replacement instructions and safety considerations. UV/Vis deuterium lamps are warranted for at least 500 hours of operation.

Series 200 Diode Array Detector

LC-135 C/235 C DETECTOR

Manuals/Maintenance Items/Accessories

LC-135 C/235 C Operator's Manual
Part No. 09938727

Maintenance Kit
Includes: Test flowcell, D2 lamp, cell lens, backpressure valve.
Part No. N2350014

Backpressure Regulator
Adjustable from 15-59 psi, stainless steel.
Part No. 09907126

Sources/Lamp

Deuterium Lamp
Part No. N2351285

Flowcells

LC-135 C and LC-235 C Flowcell Assembly
8.0 µL titanium.
Part No. N2350211

1.800.561.4646 Canada

Fluorescence and RI Detectors

Series 200 Fluorescence Detector

Combining Sensitivity *and* Specificity

The major benefit afforded by fluorescence detection is the inherent high sensitivity of the technique coupled with outstanding specificity – given that relatively few molecules natively fluoresce. Therefore, the specific excitation and emission wavelength profile aids in the characterization of individual components. The Series 200 Fluorescence Detector delivers the outstanding performance and reliability you've come to expect from PerkinElmer – backed by our unrivaled global support network.

Advanced Features Set For Any Application

Standard fluorescence detection is ideal for many diverse applications, such as the analysis of serum and plasma in pharmaceutical research, environmental analysis of toxins and pollutants, vitamin analysis, and even the analysis of food and beverage degradation products. The Series 200 includes an advanced set of features to optimize your analyses no matter the application:

- **Time Programmable** selection of both Excitation, Emission wavelengths, and autozero give this detector all the versatility you will need. By choosing the correct wavelengths, measurements are taken at the maximum level and both linearity and sensitivity improve. You can also time program the selective detection of individual components thereby minimizing background effects.
- **Spectrum Memory** allows you to store up to eight spectra in non-volatile memory for hardcopy documentation to a recorder if you choose.
- **Background Subtraction** can be programmed to "automatically" occur and remove gradient effects on baseline and background fluorescence.
- **Totally Inert Flow Cells** provide a flow path of Quartz and a Fluoro resin that will not affect your results.
- **Stackable, Series 200 Design** – the design of the Series 200 Fluorescence Detector is fully consistent with the look of the rest of the PerkinElmer Series 200 family – allowing for space-saving, unified systems stacking. A bright, easy-to-read display makes user-interaction simple.

Series 200 Fluorescence Detector, 100/120/220/240 VAC, 50/60 Hz
Part No. N2922006

Xenon Lamp
Part No. N2922082

SERIES 200 RI DETECTOR

Manuals/Maintenance Items/Accessories

Series 200 Refractive Index Detector Operator's Manual
Part No. 09938906

Sources/Lamps

Series 200 RI Tungsten Source
Part No. 02712273

Series 200 Refractive Index Detector

LC-240 FL DETECTOR

Manuals/Maintenance Items/Accessories

LC-240 Operator's Manual
Part No. L2269065

LC-240 Thermal Printer Paper
Part No. 04973263 (pkg. 5)

LC-240 R928 Photomultiplier
Part No. 09972337

Sources/Lamps

LC-240 Xenon Source Lamp
Part No. L2251157

Festoon Lamp
Part No. 04969486

Flowcells/Flowcell Accessories

LC-240 Flowcell Assembly
4.0 µL
Part No. L2265120

LC-240 Square Fused-silica Flowcell
1.5 mm
Part No. L2261145

LC-240 Square Fused-silica Flowcell
1.0 mm
Part No. L2261065

LC Detectors

LC Column Ovens and Other Accessories

Series 200 Peltier Column Ovens

In many HPLC analyses, variations in column temperature can cause significant changes in retention times, making qualitative analysis difficult and affecting the precision of quantitative measurements.

The Series 200 Peltier LC Column Oven controls the mobile phase and sample temperature before they enter the column with a built-in preheater. This eliminates thermal gradients across the column, resulting in better column performance and improved retention time precision.

The Series 200 Peltier LC Column Oven is designed to meet even the most demanding requirements. Microprocessor based control maintains the set temperature, with 0.2° C stability, across the entire 4° to 90° C temperature range. The LED display continuously shows the current "actual" temperature and the user-selected "set" temperature. The unique, easily accessed column compartment can accommodate up to three columns, including 30 cm columns such as those used in GPC analyses. The design of the column compartment also reduces tubing lengths, thus minimizing delay times and band-broadening effects.

Because the column chamber is easily accessed directly from the front of the unit without having to remove a cover, it may be stacked with other instruments, such as the Series 200 pumps, autosamplers, and detectors.

Series 200 Peltier Column Oven
Part No. N2601580

Series 200 Heat Only Oven
Part No. N2601581

Maintenance Items/Accessories

LC-235 and Integral 4000 Test Flowcell Assembly
Part No. N2350118

LC-235 Maintenance Kit
Includes: Test flowcell, D2 lamp, cell lens, and backpressure valve.
Part No. N2350014

Backpressure Regulator
Adjustable from 15-59 psi, stainless steel.
Part No. 09907126

Lamps and Sources

LC-135/235 and Integral 4000 Deuterium Lamp
Part No. N2351125

Alternate Deuterium Lamp for LC-75/85B/95/135/235 and Integral 4000
Part No. N2351285

LC-95 UV/Visible Detector Standard Deuterium Lamp
Also compatible with the LC-75 and LC-85B.
Part No. 02711340

LC-295 Deuterium Lamp
Part No. 02712266

LC-90 and LC-290 Detector Deuterium Lamp
Part No. 02712224

LC-480 Photo Diode Array Detector Deuterium Lamp
Part No. B0160917

LC-30 RI Source Lamp
Part No. 02712155

LC-25 RI Source Lamp
Part No. 02711560

Flowcells/RI Prisms (PerkinElmer Detectors)

Many of PerkinElmer's LC detectors feature multiple flowcells to meet a range of analytical needs from microbore to prep. The options are listed below with important characteristics such as cell volume and pathlength.

The LC-95, LC-135/235, and LC-480 detectors feature a self-aligning cartridge design which allows you to quickly and easily exchange or rebuild the flowcell.

LC-95 Flowcell Assembly
4.5 µL stainless steel.
Part No. 02710098

LC-295 Biocompatible Flowcell
PEEK, 8 µL, 10 mm path.
Part No. 02711763

LC-295 Preparative Flowcell
Stainless steel, 100 mL/min, 1 mm path.
Part No. 02711797

LC-295 Micro Flowcell
Stainless steel, 1.3 µL, 2.5 mm path.
Part No. 02712231

LC-480 Flowcell Assembly
18 µL
Part No. B0173402

Operator's Manuals

LC-135/235 Operator's Manual
Part No. 09937220

LC-90 Operator's Manual
Part No. 09937083

Accessories and Spares for ABI Detectors

ABI 759A UV/Vis Detectors

Manual
User's 785A.
Part No. 09936189

Deuterium Lamp
Part No. N2920149

Tungsten Lamp
Part No. N2920146

Adapter
Microbore Head.
Part No. 29000152

Flowcell
Microbore (172 System, 6 mm x 2.4 µL).
Part No. 29000197

Flowcell
Standard Analytical (8 mm x 12 µL).
Part No. 29000542

Flowcell Assembly
Microbore (non-172 System, 6 mm x 2.4 µL).
Part No. 29000544

Flowcell Assembly
Prep (3 mm x 1.7 µL).
Part No. 29000545

Reference Aperture
Dry Cell.
Part No. 29000078

Flowcell Adapter
For 12 µL flowcell.
Part No. 27000087

Flowcell Adapter
For 2.4 µL flowcell.
Part No. 25000376

Windows
Flowcell, Suprasil (pair).
Part No. 72000008

Flowcell Bulkhead Union
Part No. 25000323

Heat Exchange Assembly
Part No. 26000050

Cable Assembly
Detector Signal.
Part No. 60000186

Cable Assembly
Remote Autozero.
Part No. 60000366

Backpressure Regulator
Part No. 09907126

ABI 757 UV/Vis Detector

Deuterium Lamp
Part No. N2920149

Tungsten Lamp
Part No. N2920146

Lamp Holder Adapter
Part No. 29000286

Flowcell
Conventional LC, 12 µL vol., 8 mm path.
Part No. 29000146

Flowcell
High pressure, conventional LC, 12 µL vol., 8 mm path.
Part No. 29000324

Dry Cell Aperture
Part No. 29000078

Flowcell Adapter
SS, for 12 µL flowcell.
Part No. 27000087

Flowcell Adapter
SS, for 0.5 and 2.4 µL flowcell.
Part No. 25000376

Microbore Adapter Attachment
Model 172 style.
Part No. 29000152

Flowcell Exit Tubing
No fittings.
Part No. 25000536

Bulkhead Union
Flowcell
Part No. 25000323

Detector Signal Cable
Part No. 60000186

Flowcell Windows
Suprasil II (Pair).
Part No. 72000008

Deuterium Lamp – N2920149

ABI 773 UV/Vis Detector

User's Manual
Part No. 10000079

Deuterium Lamp
Part No. N2920149

Tungsten Lamp
Part No. N2920146

Flowcell
Conventional LC, 12 µL vol., 8 mm path.
Part No. 29000072

Flowcell
Micro or Fast LC, 2.4 µL vol., 6 mm path.
Part No. 29000197

Dry Cell Aperture
Part No. 29000078

Flowcell Adapter
SS, for 12 µL flowcell.
Part No. 27000087

Flowcell Adapter
SS, for 0.5 and 2.4 µL flowcell.
Part No. 25000376

Bulkhead Union
Part No. 25000323

Detector Signal Cable
Part No. 60000186

Flowcell Windows
Suprasil II (Pair).
Part No. 72000008

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LC Detectors

Accessories and Spares for ABI Detectors

ABI 783(A) UV/Vis Detector

Deuterium Lamp
Part No. 29000484

Tungsten Lamp
Part No. 24500213

Lamp Holder Adapter
Part No. 29000286

Flowcell
Conventional LC, 12 µL vol., 8 mm path.
Part No. 29000146

Flowcell
High pressure, conventional LC.
Part No. 29000324

Dry Cell Aperture
Part No. 29000078

Flowcell Adapter
SS, for 12 µL flowcell.
Part No. 27000087

Flowcell Adapter
SS, for 0.5 and 2.4 µL flowcell.
Part No. 25000376

Microbore Adapter Attachment
Model 172 style.
Part No. 29000152

Bulkhead Union, Flowcell
Part No. 25000323

Detector Signal Cable
Part No. 60000186

Autozero and Remote Event Mark Cable
Part No. 60000366

Flowcell Windows
Suprasil II (Pair).
Part No. 72000008

ABI 1000S Diode Array Detector

Deuterium Lamp
Part No. 29000416

Tungsten Lamp
Part No. 24500210

Flowcell Adapter
SS, for 6 µL flowcell.
Part No. 27000087

Flowcell Adapter
SS, for 3.3 µL flowcell.
Part No. 25000376

High Resolution Board Upgrade
Part No. 29000493

Parallel Printer Cable
Part No. 60000542

Detector Signal Cable
Part No. 60000186

Flowcell Windows
Suprasil II (Pair).
Part No. 72000008

ABI 980 Fluorescence Detector

Deuterium Lamp
Part No. 29000484

Tungsten Lamp
Part No. 24500213

Lamp Holder Adapter
Part No. 29000286

(Emission Bandpass Filters are 25 nm bandwidth filters.)

Emission Bandpass Filter
450 nm
Part No. 27000098

Emission Bandpass Filter
475 nm
Part No. 27000099

Detector Signal Cable
Part No. 60000186

ABI Detector Accessories

Valco Bulkhead Union
Part No. 25000323

Suprasil II Flowcell Windows
Pair
Part No. 72000008

Detector Signal Cable
6 ft.
Part No. 60000186

Autozero and Remote Event Mark Cable
Part No. 60000366

Autozero
Remote event mark, load, and abort cable.
Part No. 60000394

Relay Outputs Access Cable
Part No. 60000393

TotalChrom™ Chromatography Data Handling Systems

1.800.561.4646 Canada

PerkinElmer's TotalChrom Chromatography Data System is designed to provide laboratories with the total answer to chromatography data handling needs. TotalChrom is an improved and enhanced version of the software previously released as Turbochrom™.

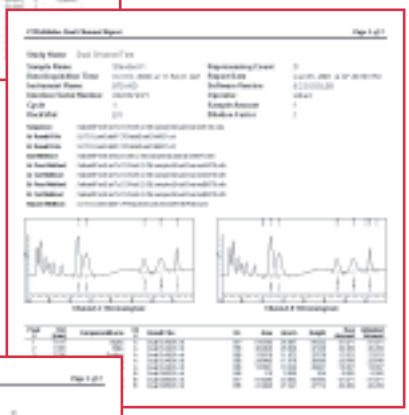
When configured with a PerkinElmer AutoSystem™ XL Gas Chromatograph or a PerkinElmer Series 200 Liquid Chromatograph, the TotalChrom Workstation (TCWS) Data System is the controller and data manager for the overall system. TotalChrom Workstation systems can also control selected instruments from other vendors and can acquire data from any chromatographic system.

The TotalChrom Client/Server (TC C/S) Data System provides the same features as the Workstation system in a multi-user environment. TC C/S systems can easily integrate all existing chromatographs into a single networked system supporting an unlimited number of users and an unlimited number of chromatographs. Coupled with the new Oracle based TC Database, which offers file storage and query capability, TotalChrom C/S is a complete data system to handle all laboratory needs.

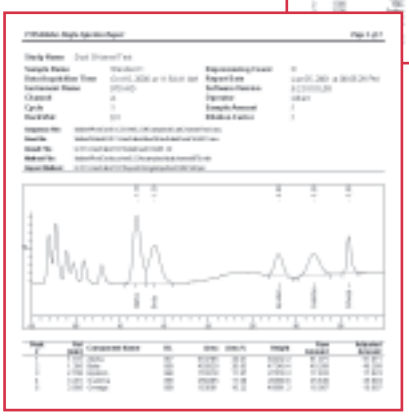
New features of TotalChrom 6.2 include TCPublisher®, the most powerful chromatography reporting tool available, and additional features to aid in compliance with 21 CFR Part 11 regulations. TCPublisher allows automatic generation of an endless variety of reports. TCPublisher supports single injection reports, dual column reports, and summary reports. Default reports, are supplied as examples and a sophisticated layout tool is provided to modify existing report designs or to design new ones. Reports easily integrate text, data, and graphics. Separate text tables can be used for each different sample type and each table can select independent peaks, data, and calculations.

TotalChrom Navigator Screen

TCPublisher Replicate Injections Report



TCPublisher Dual Channel Report



TCPublisher Single Injection Report

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TotalChrom™ Chromatography Data Handling Systems

TotalChrom Workstation

1.800.762.4000 US

TotalChrom Workstation Software

TotalChrom Workstation Single Instrument Software Kit
Part No. N5150101

TotalChrom Workstation Dual Instrument Software Kit*
Part No. N5150102

TotalChrom Workstation Multi-instrument Software Kit*
Part No. N5150103

TotalChrom Workstation Reprocess Only Software Kit
Part No. N5150100

TotalChrom Workstation Manuals

TotalChrom Workstation Manual Set
Complete manual set including User's Guide (volumes 1 and 2), Application Manager's Guide and Tutorial.
Part No. N5150512

TotalChrom Workstation User's Guide (Volumes 1 and 2)
User's Manual covering instrument configuration and basic operation of TotalChrom Workstation software.
Part No. N5150518

TotalChrom Workstation Application Manager's Guide
Application Manager's Guide covering installation and system management of TotalChrom Workstation software.
Part No. N5156025

TotalChrom Tutorial
Software tutorial that teaches basic data acquisition, method development, optimization techniques, sequence development, and calibration.
Part No. N5156021

TotalChrom Workstation IQ/OQ Manual
Includes TotalChrom IQ/OQ documentation set. Set includes both hard copy and electronic documentation. Consult with your local service administrator for availability of additional services such as IQ/OQ Installation.
Part No. N5150519

TotalChrom Workstation SI/DI Upgrade Kits

TotalChrom Workstation Single Instrument to Dual Instrument Upgrade Kit*
Upgrades existing TotalChrom Workstation Single Instrument System to Dual Instrument System capability. Also compatible with Turbochrom™ Workstation v.6 data systems.
Part No. N5150112

TotalChrom Workstation Single-instrument to Multi-instrument Upgrade Kit*
Upgrades existing TotalChrom Workstation Single-instrument System to Multi-instrument System capability. Also includes one Reprocess Only license. Also compatible with Turbochrom Workstation v.6 data systems.
Part No. N5150113

TotalChrom Workstation Dual-instrument to Multi-instrument Upgrade Kit*
Upgrades existing TotalChrom Dual-instrument Software to Multi-instrument version. Also includes one Reprocess Only license. Also compatible with Turbochrom Workstation v.6 data systems.
Part No. N5150114

**If no IEEE-488 board (Part No. S2700402), NCI, or terminal server exists in the current system configuration, it will be necessary to purchase one or more of these parts for additional instrument connectivity.*

TotalChrom Optional Software

System Suitability Software for TotalChrom and Turbochrom Workstation Software
Part No. N5150180

CONNECT for TotalChrom and Turbochrom Workstation Software
Part No. N5150182

Size Exclusion Software (TurboSEC) for TotalChrom and Turbochrom Software
Part No. N5150183

TurboScan200 Spectral Processing Software for TotalChrom Workstation
Part No. S2700055

Turbo Methods Development Software for TotalChrom Workstation
Part No. S2701021

Version Upgrades to TotalChrom Workstation Software

Turbochrom Professional v.4.x Single Instrument Migration to TotalChrom Workstation Single Instrument Software
Part No. N5150341

Turbochrom Professional v.4.x Dual Instrument Migration to TotalChrom Workstation Dual Instrument Software
Part No. N5150342

Turbochrom Professional v.4.x Multi-instrument Migration to TotalChrom Workstation Multi-instrument Software
For users who have purchased TC Pro prior to 7/28/97.
Part No. N5150343

Turbochrom Professional v.4.x RPO Migration to TotalChrom Workstation RPO Software
Part No. N5150340

Turbochrom Workstation v.6.x to TotalChrom Workstation v.6.2 Software
Part No. N5150349

TurboScan (Turbochrom 4) Upgrade to TurboScan200 for TotalChrom Workstation
Upgrades TurboScan for TC Pro to TurboScan200 for TotalChrom Workstation. Also compatible with Turbochrom v.6.1 or greater Workstation systems.
Part No. S2700056

Turbo Methods Development Software Upgrade for TotalChrom Workstation
Upgrades Turbo Methods Development (TMD) Software for TC Pro to TMD for TotalChrom Workstation. Also compatible with Turbochrom v.6.1 and higher Workstation systems.
Part No. 04308554

TotalChrom™ Chromatography Data Handling Systems

TotalChrom Turnkey LC

TotalChrom Turnkey consists of TotalChrom Workstation Single Instrument software preinstalled on a Dell computer. It includes everything needed to control, acquire, report, and store data from PerkinElmer Series 200 LC pumps, detectors, and autosamplers. Additional PerkinElmer modules are also supported but may require the purchase of additional cables. For other instrumentation contact your local sales representative. The computer comes with network capability and memory expansion slots. It does not include a sound card. TotalChrom Workstation Single Instrument Software, System Suitability Software, IVM Software, and appropriate instrument IPM License PAKs will be preinstalled. Includes PerkinElmer LC IPM, User's, and Application Manager's Guides, Tutorial, 610 LINK, serial cable, and appropriate instrument cables for connectivity. May require, but does not include, analog, BCD, Ready/Run, and Start/Stop cables. Not recommended for Series 200 Diode Array-based systems.

Part No. **N5150612 (120 V)**

Part No. **N5150613 (240 V)**

(Requires, but does not include, three 240-volt power cords.)

TotalChrom Turnkey 901

TotalChrom Turnkey consists of TotalChrom Workstation Single Instrument software preinstalled on a Dell computer. This is a single-channel, analog detector solution that allows TotalChrom to acquire, report, and store any vendor's chromatographic data. The computer comes with network capability and memory expansion slots. It does not include a sound card. TotalChrom Workstation Single Instrument Software, System Suitability Software, and IVM Software will be preinstalled. Includes User's and Application Manager's Guides, Tutorial, NCI 901 A/D Intelligent Interface, and PC to NCI serial cable. May require, but does not include, analog, BCD, Ready/Run, and Start/Stop cables.

Part No. **N5150614 (120 V)**

Part No. **N5150615 (240 V)**

(Requires, but does not include, three 240-volt power cords.)

TotalChrom Turnkey 902

TotalChrom Turnkey consists of TotalChrom Workstation Single Instrument software preinstalled on a Dell computer. This is a dual-channel, analog detector solution that allows TotalChrom to acquire, report, and store any vendor's chromatographic data. The computer comes with network capability and memory expansion slots. It does not include a sound card. TotalChrom Workstation Single Instrument Software, System Suitability Software, and IVM Software will be preinstalled. Includes User's and Application Manager's Guides, Tutorial, NCI 902 A/D Intelligent Interface, and PC to NCI serial cable. May require, but does not include, analog, BCD, Ready/Run, and Start/Stop cables.

Part No. **N5150616 (120 V)**

Part No. **N5150617 (240 V)**

(Requires, but does not include, three 240-volt power cords.)

Intelligent Interfaces for TotalChrom™

All TotalChrom systems utilize PerkinElmer Intelligent Interfaces to connect each chromatography system to the data system PC. Each interface contains buffered RAM memory to maintain data collection in the event that the PC or PC network becomes inoperative during data acquisition. Data from instruments is never lost and chromatograph productivity is preserved.

Analog chromatographs connect to TotalChrom through NCI (Network Chromatography Interface) Series Intelligent Interfaces. The model NCI 901 is a single-channel device, while the model NCI 902 is a dual-channel device. Both interface models are capable of taking analog detector data (unipolar or bipolar) at sampling rates from 0.1 to 100 Hz.

Digital chromatographs connect to TotalChrom through the Model 600 Series LINK Intelligent Interfaces. Multiple instruments can be connected to each LINK interface via the four serial ports included on each interface. Each port is capable of receiving signals from two detectors per chromatograph. In addition to collecting digital detector data, LINK interfaces also provide instrument control capability.

For TotalChrom Workstation and TotalChrom C/S, Intelligent Interfaces may be connected to a PC via either IEEE-488 cabling, a PC com (serial) port, or a Terminal Server. Com Port and Terminal Servers utilize serial cabling.

Series 900A Interface Connector Clips
Spare kit of model 950A, 970A, and 941A Interface analog connector clips.
Part No. S9000402

Series 900 Interface Connector Clips
Spare kit of model 950, 960, 970, and 941 Interface analog connector clips.
Part No. 85090101

NCI Series Interface Connector Clips
Spare kit of NCI 901/902 Interface connector clips.
Part No. S9000405

Interface Validation Modules (IVM)

Model 520 Interface Validation Module, 120 V
The Model 520 IVM is a calibrated analog peak pattern generator for use in testing/validating analog to digital converters such as the NCI 901/902 and the Series 900/900A Intelligent Interfaces. The module generates eight possible analog patterns at selectable voltage ranges of 0-.1, 0-1, 0-2, and 0-10 volts. Factory calibration is traceable to a NIST standard volt. Includes remote start/stop cable and analog signal cable for connection to PerkinElmer NCI/900/900A Series Intelligent Interfaces. Includes one-year return to Service Depot warranty.
Part No. S9000160 (120 V)
Part No. S9000165 (240 V)

TotalChrom™ Workstation Model 520 IVM Software
Allows user to test any NCI Series and M900A Series Intelligent Interfaces to validate interface operations (linearity, reproducibility, etc.). Contains special TotalChrom interface test methods and automated validation logs to maintain results of interface tests in software. Requires, but does not include, a Model 520 Interface Validation Module.
Part No. N5150181

Interface Personality Modules (IPM)

IPMs are instrument-specific software programs that interpret and translate instrument control and data acquisition parameters between TotalChrom and a specific digital instrument. IPMs are downloaded from the host PC (TotalChrom) by a configuration function to a specific serial port on a Model 600 LINK interface. Downloaded IPMs are stored in nonvolatile memory in the LINK interface. Each IPM can be configured to any port or ports on any LINK interface connected to the TotalChrom acquisition PC. Each TotalChrom system (except Turbochrom EL) can support up to a maximum of eight instruments connected via Model 900 Series, NCI Series, Interfaces, and/or Model 600 LINK Series interfaces.

IPM For Agilent 1100 HPLC
Provides control for the Agilent series 1100 HPLC modules. Each LINK Interface (M610 only) can accommodate one HPLC instrument system. Requires but does not include serial communication cable for each Agilent 1100 module controlled by TotalChrom.
Part No. N5150167 for TotalChrom Workstation
Part No. N5150267 for TotalChrom Client Server

IPM for PerkinElmer LC Systems
Provides complete control of PerkinElmer HPLC pumps, random access autosampler, diode array detectors (S200 and LC-235C), dual channel UV detector (LC-135C), and programmable UV/Vis detectors (S200 and LC-785A)* with simultaneous digital data acquisition from two channels per detector. This IPM may be configured across one or more 600 Series LINK interface(s) on a single TotalChrom acquisition system. Each LINK interface can accommodate one HPLC instrument system. Requires, but does not include, one Turbo LC Plus Communications Kit for each LC module controlled by TotalChrom Workstation. Also compatible with Turbochrom Workstation v.6 data systems.
Part No. N5150162 for TotalChrom Workstation
Part No. N5150262 for TotalChrom Client Server

**Series 200 UV/Vis detector requires TotalChrom or Turbochrom Workstation v 6.1.2 or higher.*

M600 Series LINK and NCI Series Interfaces

Model	Memory	Recommended Applications	Voltage	Part No.
Model 600 LINK	256 KB	1 LC System	120 240	90060001 S9000018
Model 610 LINK	1 MB	1 LC System	120 240	90061001 S9000019
Integral LINK Add-on Kit (brown)	256 KB	AutoSystem™ GC AutoSystem XL GC	N/A	N6120066
Integral LINK Add-on Kit (white)	256 KB	AutoSystem GC AutoSystem XL GC	N/A	N6120180
NCI 901	256 KB	Single Inst./Single Detector GC, LC, IC, or CE use	120 240	S9000070 S9000075*
NCI 902	256 KB	Single Inst./Dual Detector GC, LC, IC, or CE use	120 240	S9000090 S9000095*

**Select appropriate power cord (No Charge) from list below. All 120 V interfaces include USA power cord. Canada, Japan, Taiwan, Puerto Rico, Bahamas, and most Latin American countries use 120 V interface version.*

Power Cords – 240 V (No Charge When Ordered with 240 V Interface)

Country	Part No.
UK, Cyprus, Nigeria, Zimbabwe, Singapore, Malaysia, Zambia	09991414
Australia, New Zealand	09991417
Europe, Saudi Arabia, Egypt, South Africa, India, Thailand, China	09991415
Denmark, Greenland	09991416
Switzerland, Liechtenstein	09991413

IEEE Cables (All TC Versions)

Cable Length	Part No.
1 m	65105001
2 m	65105102
4 m	65105204
8 m	65105408

IEEE Cable Connector Extender

Extender attachment for use on computers where the PC case interferes with connection of the IEEE cable. Attaches to the IEEE board connector on back of PC case.

Part No. 09997196

TotalChrom WS and C/S Serial Cables to Lantronix Terminal Server for M950/970 Interfaces

Cable Length	Part No.
7 ft.	S5010017
25 ft.	S5010018
50 ft.	S5010019
100 ft.	S5010020

TotalChrom WS and C/S Serial Cables to Lantronix Terminal Server for M941/M600 LINK Interfaces

Cable Length	Part No.
7 ft.	S5010021
25 ft.	S5010022
50 ft.	S5010023
100 ft.	S5010024

TotalChrom WS and C/S Serial Cables to Lantronix Terminal Server for NCI Interfaces

Cable Length	Part No.
7 ft.	S5010037
25 ft.	S5010038
50 ft.	S5010039
100 ft.	S5010040

TotalChrom WS and C/S Serial Cables to PC for M941 A and M600/610 Link Interfaces

Cable Length	Part No.
7 ft.	S5010025
25 ft.	S5010030
50 ft.	S5010031
100 ft.	S5010032

TotalChrom WS and C/S Serial Cables to PC for NCI Interfaces

Cable Length	Part No.
7 ft.	S5010033
25 ft.	S5010034
50 ft.	S5010035
100 ft.	S5010036

Serial Cables* for Instrument to M600 LINK Interface

Description	Part No.
Agilent 1100 HPLC to M600/M610 LINK, 10 ft.	S5010015
Agilent 1100 HPLC to M600/M610 LINK, 25 ft.	S5010016
M900/960/970 Series Interface to M600/M610 LINK, 6 ft. (not for M941)	S5010013
NCI Series Interface to M600/M610 LINK, 6 ft.	S5010041
PerkinElmer ISS 200 Autosampler to M610 LINK, 6 ft.	09410015
PerkinElmer Series 200 Autosampler to M610 LINK, 6 ft.	N2930343
PerkinElmer Model 250 Pump, Series 410 Pump to M610 LINK, 6 ft.	09410015
PerkinElmer LC 235C Diode Array Detector to M610 LINK, 6 ft.	09410015
PerkinElmer Series 200 Pump to M610 LINK, 6 ft.	09410020
PerkinElmer Series 200 Diode Array Detector to M610 LINK, 6 ft.	N2922013
PerkinElmer Model 785A UV/Vis Detector to M610 LINK, 6 ft.	09410036
PerkinElmer Series 200 UV/Vis Detector to M610 LINK, 6 ft.	N2930343

**Special serial cards, instrument communication kits, and IPM software may be required to complete interfacing of a LINK interface to a digital chromatograph. Please contact your local PerkinElmer Sales Representative for details.*

M900 Series BCD Cables for Autosamplers

Description	Part No.
Varian 8000* Autosampler	65204101
Waters WISP Autosampler	65204001
PerkinElmer ISS 200 Autosampler	S5010002
PerkinElmer S200 Autosampler	N2930340

**Autosampler must be equipped with BCD option.*

HPLC Columns

Brownlee™ Columns

1.800.762.4000 US

Modes of Separation

Reversed-phase chromatography (RPC) is the most popular HPLC mode and is used in 60-80% of all applications. In RPC, hydrophobic groups (C18, C8, or C4) bonded to a silica support are used together with a mobile phase of water and organic solvent (e.g. methanol, acetonitrile).

Polar phase (normal phase) chromatography (NPC) uses a polar stationary phase (unbonded silica, bonded amino or cyano group) together with a non-polar mobile phase (e.g., hexane). NPC is useful for functional group analysis, isomeric separations, purification of organics, and sample cleanup.

Ion-exchange chromatography (IEC) utilizes bonded ionic groups to separate ionic analytes. Retention is based on the affinity of various analyte ions for the stationary phase and various mobile phase parameters (e.g., pH, ionic strength).

Brownlee Sorbents

Brownlee offers a wide selection of sorbents based on both silica and polymer supports.

Aquapore® is a wide-pore (300 Å, 7, and 20 µm), silica-based support suitable for the separation of large biopolymers.

Spheri-5® is a small-pore (80 Å, 5 µm), silica-based sorbent for separating small molecules. Both monofunctional (comb-type) and polyfunctional (polymerized loop-type) C8 and C18 sorbents are available.

Polypore® is a polymer-based (microporous, 10 µm) sorbent for the analysis of organic acid and sugars.

Validated™ is a small-pore (100 Å, 5 µm) silica-based C18 sorbent for small molecules, specifically for consistent pharmaceutical assays.

Pecosphere™ is a small-pore (80 Å, 3, 5, and 10 µm) silica-based sorbent for HPLC of small molecules.

Reduced Activity is a small-pore, base-deactivated (100 Å, 3, and 5 µm) silica-based, reversed-phase sorbent (C18 or C8) developed for HPLC of basic analytes and pharmaceuticals.

CHOICE™ is a small-pore, base-deactivated (100 Å, 3 µm C18) silica-based, reversed-phase sorbent (C18) developed for LC/MS separations.

Analytical Cartridges for Conventional and Narrowbore HPLC*

- Analytical cartridges from the traditional Brownlee line are available in three lengths (30, 100, and 220 mm), and two internal diameters (4.6 and 2.1 mm). The MPLC cartridge system allows direct coupling of a cartridge to a guard without any dead volume. Changing cartridges is easy with the finger-tight cartridge design which does not require any wrench-tightening of the holder or disconnecting of tubing from the LC system. A specific cartridge holder is required for each cartridge length. Additional information on MPLC holders can be found on page LC-33. Pressure ratings are 7,000 psi for silica-based columns.
  - Quality: Columns are manufactured under stringent ISO-9001 certified quality control standards. Individual test chromatograms are included with each 100 mm and 220 mm cartridge.
  - Flexible: Same reusable holder for 4.6 and 2.1 mm i.d. cartridges. Compatible with all HPLC instruments. Choice of different cartridge lengths to enhance speed or resolution.
  - Economical: Cartridges are less expensive than conventional columns. Solvent consumption reduced by using narrowbore or shorter columns.
- Experience: 25 years of manufacturing experience since Bob Brownlee introduced the first finger-tight cartridge system in 1977.

**Microbore, semi-preparative and conventional MPLC columns found on pages LC-31 and LC-34.*

Brownlee Columns and Holders

Specifications

SPHERI-5® IS A SPHERICAL 5 µm SILICA-BASED SUPPORT FOR SEPARATING SMALL MOLECULES.

Product	Functionality	Pore Diameter	Surface Area (M^2/G)	% Carbon	End Cap
Spheri-5, RP-8	Octyl (C8) monofunctional	80 Å	180	6%	Yes
Spheri-5, RP-18	Octadecyl (C18) monofunctional	80 Å	180	11%	Yes
Spheri-5, ODS	Octadecyl (C18) polyfunctional	80 Å	180	14%	Yes
Spheri-5, Phenyl	Phenyl	80 Å	180	6%	Yes
Spheri-5, Silica	Hydroxyl	80 Å	180	N/A	N/A
Spheri-5, Amino	Aminopropyl	80 Å	180	3%	No
Spheri-5, Cyano	Cyanopropyl	80 Å	180	4%	No

AQUAPORE® IS A SPHERICAL 7 µm SILICA-BASED SUPPORT FOR BIOSEPARATIONS.

Product	Functionality	Pore Diameter	Surface Area (M^2/G)	% Carbon	End Cap
Aquapore ODS OD-300	Octadecyl (C18)	300 Å	100	10%	Yes
Aquapore Octyl, RP-300	Octyl (C8)	300 Å	100	5%	Yes
Aquapore Butyl, BU-300	Butyl (C4)	300 Å	100	3%	Yes
Aquapore weak anion, AX-300	Polyethyleneimine	300 Å	100	N/A	N/A

POLYPORE® IS A SPHERICAL 10 µm POLYMER-BASED SUPPORT FOR BIOSEPARATIONS.

Product	Functionality	Pore Diameter
Polypore H for organic acid separation	Hydrogen form	Microporous
Polypore CA for sugar separation	Calcium form	Microporous

Note: *Maximum pressure is 1400 psi for Polypore Columns.*

Molecular Weight	Solubility		Mode	Sorbent
<2000	Organic	Hexane	Adsorption	Spheri-5® Silica, Pecosphere™ Silica
			Polar phase	Spheri-5 Cyano, Amino
		Alcohol	Reversed phase	RP-8: Spheri-5, Peco™ Red. Act.-3 and 5 RP-18: Spheri-5, Pecosphere-3 and 5, Peco Red. Act.-3 and 5 Spheri-5, ODS, Phenyl, Cyano, CHOICE
	Water	Non-ionic	Polar phase	Spheri-5 Cyano, Amino
			Reversed phase	RP-8: Spheri-5, Peco Red. Act.-3 and 5 RP-18: Spheri-5, Pecosphere-3 and 5, Peco Red. Act.-3 and 5 Spheri-5, ODS, Phenyl, Cyano, CHOICE
		Ionic	Ion exchange	Aquapore® AX-300
>2000	Water		Ion exchange	Aquapore AX-300
			Wide-pore reversed phase	Aquapore OD-300, RP-300, BU-300

Column Selection Guide for Biological Applications

Molecular Weight	Mode	Sorbent
Proteins	Wide-pore reversed phase	Aquapore OD-300, RP-300, BU-300
	Ion exchange	Aquapore AX-300
Peptides	Reversed phase	Validated™, Peco Red. Act.-3 and 5, CHOICE
	Wide-pore reversed phase	Aquapore OD-300, RP-300, BU-300
	Ion exchange	Aquapore AX-300
Amino acids	Reversed phase	Spheri-5 RP-18, Validated
Oligonucleotides, Nucleotides	Wide-pore reversed phase	Aquapore OD-300, RP-300, Speri-5 RP-18, CHOICE
	Ion exchange	Aquapore AX-300
Nucleosides	Reversed phase	Spheri-5 RP-18, CHOICE
Organic acids	Mixed mode	Polypore H
Sugars	Mixed mode	Polypore CA

Specific Recommendations

– Pharmaceutical/Clinical: Validated, Red. Act.-3
– Protein/Peptides: Aquapore OD-300, RP-300, BU-300
– DNAs/Polynucleotides: Aquapore RP-300
– Industrial/Food: Spheri-5, Pecosphere, Red. Act.-3
– Environmental: Spheri-5, Pecosphere, Red. Act.-3
– Sugars: Spheri-5 Amino, Polypore CA
– Organic Acids/Alcohols: Polypore H

Support Types

Silica is the most common HPLC support. It is efficient and rugged, but has a limited pH range of 2-7. Polymer-based supports (polystyrene copolymer) offer a greater pH range of 1-14, but have lower pressure ratings and some limitations with organic solvents. Small-pore (80-100 Å) supports are used for small molecules, while wide-pore supports (300 Å) are better suited for proteins or other macro-molecules.

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HPLC Columns

Brownlee™ MPLC® Columns

Reversed Phase

	30 mm 4.6 mm i.d. 2 per pkg. (Requires holder 07150013) Part No.	30 mm 2.1 mm i.d. 2 per pkg. (Requires holder 07150013) Part No.	100 mm 4.6 mm i.d. 1 per pkg. (Requires holder 07150014) Part No.	100 mm 2.1 mm i.d. 1 per pkg. (Requires holder 07150014) Part No.	220 mm 4.6 mm i.d. 1 per pkg. (Requires holder 07150015) Part No.	220 mm 2.1 mm i.d. 1 per pkg. (Requires holder 07150015) Part No.
RP-8, Spheri-5® C-8, monofunctional, 5 µm, 80 Å	07110001	07110002	07110003	07110004	07110005	07110006
RP-8, Spheri-10 C-8, monofunctional, 10 µm, 80 Å	07110121		07110123			
RP-18, Spheri-5 C-18, monofunctional, 5 µm, 80 Å	07110013	07110014	07110015	07110016	07110017	07110018
RP-18, Spheri-10 C-18, monofunctional, 10 µm, 80 Å	07110115		07110117		07110119	
ODS, Spheri-5 C-18, polyfunctional, 5 µm, 80 Å	07110019	07110020	07110021	07110022	07110023	07110024
Phenyl, Spheri-5 Phenyl, 5 µm, 80 Å	07110025		07110027		07110029	
OD-300, Aquapore® ODS C-18, 7 µm, 300 Å	07110235	07110234	07110232	07110233	07110231	07110236
RP-300, Aquapore Octyl C-8, 7 µm, 300 Å	07110055	07110056	07110057	07110058	07110059	07110060
BU-300, Aquapore Butyl C-4, 7 µm, 300 Å	07110061	07110062		07110064		
Cyano, Spheri-5 Cyanopropyl, 5 µm, 80 Å	07110043		07110045		07110047	

Polar Phase

Silica, Spheri-5 5 µm, 80 Å	07110031	07110032	07110033		07110035	
Silica, Spheri-10 10 µm, 80 Å	07110145					
Amino, Spheri-5 Aminopropyl, 5 µm, 80 Å	07110037		07110039		07110041	
Cyano, Spheri-5 Cyanopropyl, 5 µm, 80 Å	07110043		07110045		07110047	

Ion Exchange

AX-300, Aquapore 7 µm, 300 Å, weak anion	07110073	07110074	07110075		07110077	
Polypore® H 10 µm, polymeric, hydrogen form	07110085		07110087		07110089	
Polypore CA 10 µm, polymeric, calcium form	07110091		07110093		07110095	

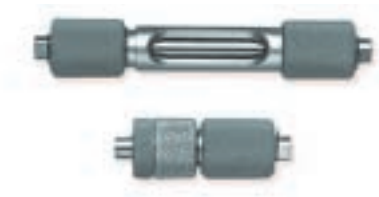
Note: *See page LC-34 for additional MPLC holders.*

Fast LC with 3x3™ Peco Columns

PerkinElmer pioneered the development of Fast LC and introduced the popular 3x3 Columns (33 x 4.6 mm) in the 80s. The 3x3 Column is capable of very rapid analyses, as short as one to two minutes. These columns are available in economical packs of five. The 80 mm long 3x8 Column with >10,000 plates can separate many complex mixtures in less than 10 minutes.

PerkinElmer's Peco cartridges (including Fast LC) are available with MPLC® holders. Three cartridge lengths (30, 80, and 150 mm) are available in 4.6 mm i.d. Additionally, the Peco cartridges are still compatible with the "old-style" Peco cartridge holders (wrench-tightened). Three Peco silica-based supports are available.

Pecosphere™ is a small-pore, extremely rugged (80 Å, 3, 5, and 10 µm, C18 or silica) sorbent for HPLC of small molecules.

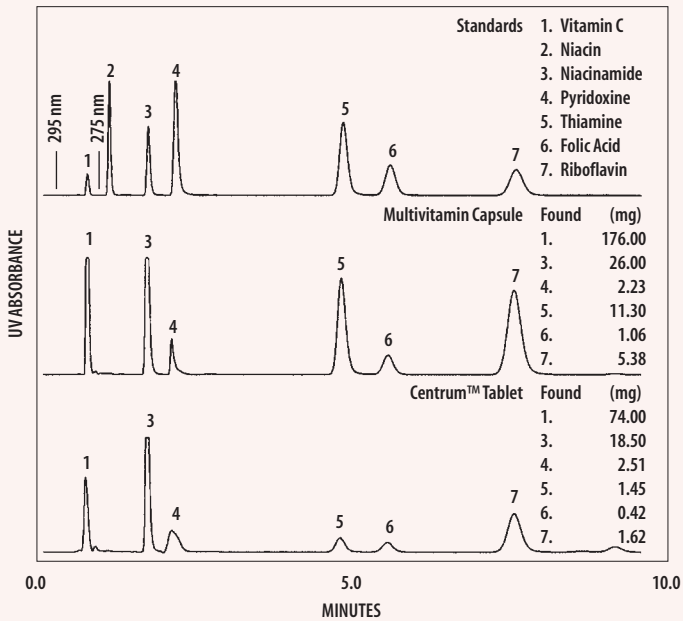


Peco MPLC holders (80 mm and 30 mm).

Reduced Activity is a small-pore, base-deactivated (100 Å, 3, and 5 µm, C8 or C18) sorbent developed for HPLC of basic analytes and pharmaceuticals. The proprietary bonding chemistry increases its resistance to acidic mobile phase.

Peco HCODS is a wide-pore (300 Å, 5 µm, polyfunctional C18) sorbent for separation of proteins and peptides.

SCAVENGER COLUMNS are small precolumns (33 x 4.6 mm i.d.) packed with 10 µm, C18 or silica materials. The scavenger is placed before the injector to protect the analytical column from mobile phase contaminants. Its use is mandatory for Fast LC to prolong column life. It is available as a pack of five and requires the Peco MPLC holder.



Analysis of water-soluble vitamins in multivitamin tablets.

Column: Reduced-activity 3 µm C8 column (83 mm x 4.6 mm i.d.)
Detection: UV Absorbance at 275 nm
Mobile Phase: 15% methanol, 85% [10 mM hexanesulfonate, 1% acetic acid, 0.13% triethylamine in water]
Flow Rate: 1.5 mL/min. at 35° C
Sample: 5 µL of vitamin tablet extracts

Specifications

Product	Functionality	Particle Size	Pore Diameter	Surface Area (M^2/G)	% Carbon	End Cap
Pecosphere 3 C18	C18, monofunctional	3 µm	80 Å	170	11%	Yes
Pecosphere 5 C18	C18, monofunctional	5 µm	80 Å	170	11%	Yes
Reduced Activity 3 C18	C18, monofunctional	3 µm	80 Å	200	12%	Yes
Reduced Activity 3 C8	C8, monofunctional	3 µm	80 Å	200	5%	Yes
Reduced Activity 5 C18	C18, monofunctional	5 µm	80 Å	200	12%	Yes
Reduced Activity 5 C8	C8, monofunctional	5 µm	80 Å	200	5%	Yes
Peco HCODS	C18, polyfunctional	5 µm	300 Å	90	9%	No
C18 Scavenger	C18, monofunctional	10 µm	80 Å	170	11%	Yes

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HPLC Columns

Fast LC and Peco™ Columns

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Reversed Phase

Description	33 x 4.6 mm i.d., 5 per pkg. (Requires holder 07150028) Part No.	83 x 4.6 mm i.d., 1 per pkg. (Requires holder 07150029) Part No.	150 x 4.6 mm i.d., 1 per pkg. (Requires holder 07150030) Part No.
Pecosphere 3 C18 Monofunctional, 3 µm, 80 Å	02580164	02580166	
Pecosphere 5 C18 Monofunctional, 5 µm, 80 Å			02580169
Pecosphere 3CR C8 Monofunctional Base Deactivated, 3 µm, 80 Å	02580191	02580192	
Pecosphere 3CR C18 Monofunctional Base Deactivated, 3 µm, 80 Å	02580195	02580194	
Reduced Activity 3 C18 Monofunctional, 3 µm, 80 Å	N9303395	N9303394	
Reduced Activity 3 C8 Monofunctional, 3 µm, 80 Å	N9303391	N9303392	
Reduced Activity 5 C18 Monofunctional, 5 µm, 80 Å			N9303396
Reduced Activity 5 C8 Monofunctional, 5 µm, 80 Å			N9303368
Peco HCODS C18 Polyfunctional, 5 µm, 300 Å			02580213

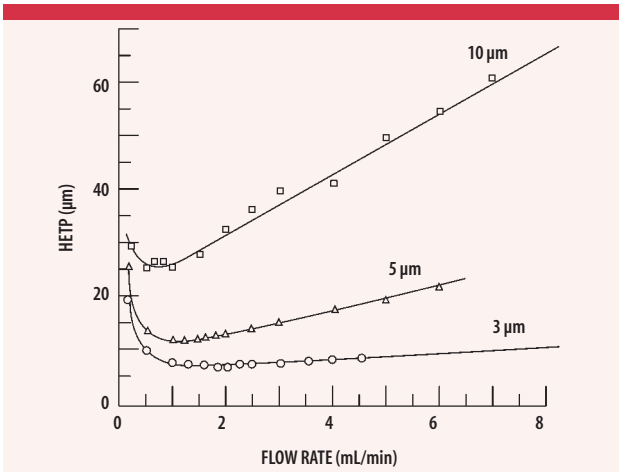
Normal Phase

Pecosphere 3 Silica	02580167

Scavenger Columns

Silica Scavenger, 10 µm	02580203
C18 Scavenger Monofunctional, 10 µm, 80 Å	02580202

Note: *See page LC-33 for details on Peco MPLC holders.*



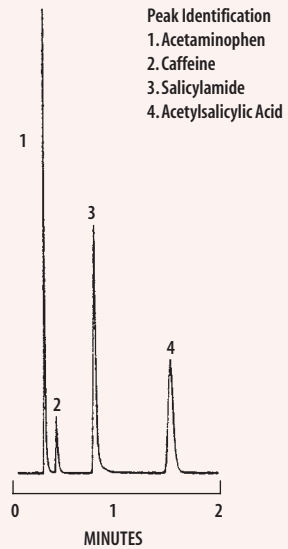
Van Deemter's curves showing column plate height vs. flow rate for 3, 5, and 10 µm particle columns. The 3 µm particle is preferred for Fast LC because of its superior performance and higher optimum flow rate.

References:

J. R. Gant and M.W. Dong, "Practical benefits of high-speed LC in pharmaceutical analysis," Pharm. Tech., 11(10), 44, 1987.

M. W. Dong, J.R. Gant, and P.A. Perrone, "Extending the lifetime of LC columns by using guard and scavenger columns," LC.GC 3, 786, 1985.

M.W. Dong and J. L. Pace, "A validated HPLC method for the analysis of multivitamins," LC.GC, 1996, in press.



Analysis of an analgesic tablet using Fast LC.

Column:	Pecosphere 3 x 3 C18 (33 x 4.6 mm)
Detection:	UV at 240 nm
Mobile Phase:	15% CH_3CN in H_2O
Flow Rate:	2.0 mL/min.
Sample:	1 µL of the tablet extract

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Brownlee™ Validated™ MPLC® Columns

Important Features of Validated Columns

- Convenient cartridge design.
- Guaranteed batch-to-batch reproducibility.
- Test Chromatogram and Certification of Compliance shipped with each column (except for 30 mm and NewGuard®).
- Packed with a 5 µm reduced activity monofunctional C18 sorbent.
- Compatibility with acidic, neutral, and basic analytes.
- Excellent column lifetime.
- Available in 30 mm, 100 mm, 150 mm, or 220 mm MPLC cartridges (2.1 mm and/or 4.6 mm i.d.).
- Select 100 mm cartridge for routine assays.
- 30 mm cartridge for screening or as a replaceable front end.
- Use 2.1 mm i.d. cartridges to reduce solvent consumption.
- Lot history tracking system.

Validated Sorbent

The Validated sorbent is derived from a neutral "Type B" silica with inherent low silanophilic activity. Each sorbent lot is tested to meet stringent specifications for the separation of basic, neutral, and acidic test probes. Column lifetime studies and additional selectivity evaluations using real samples are also conducted. A high-temperature bonding technique is coupled with an exhaustive end-capping procedure to ensure maximum coverage of the silica surface. A proprietary treatment step is used to further eliminate any trace residual metals in the silica that create active adsorptive sites. The result is a highly deactivated column which yields excellent peak shape for difficult basic analytes, pharmaceuticals, and small peptides.

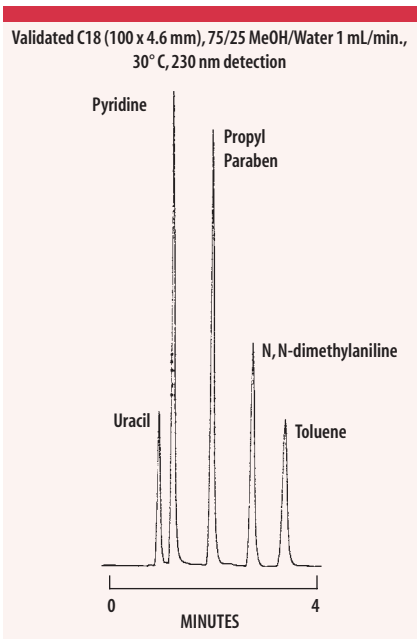
Specifications

Product	Functionality	Pore Diameter	Surface Area (M^2/G)	% Carbon	End Cap
Validated (5 µm)	C18 monofunctional	100 Å	350 ± 10%	18%	Yes

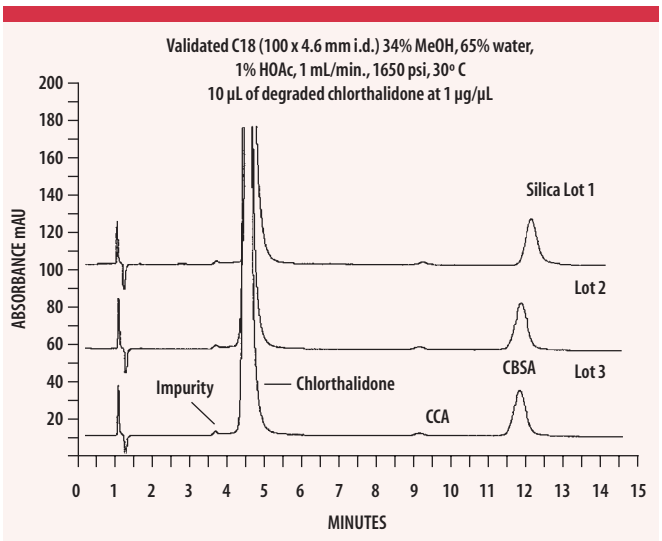
Validated HPLC Columns

Description	Part No.
Validated C18, 220 x 4.6 mm (requires 220 mm Holder 07150015)	**00402243**
Validated C18, 150 x 4.6 mm (requires 150 mm Holder 07150030)	**00403058**
Validated C18, 100 x 4.6 mm (requires 100 mm Holder 07150014)	**00402241**
Validated C18,100 x 2.1 mm (requires 100 mm Holder 07150014)	**00402240**
Validated C18, 30 x 4.6 mm (requires 30 mm Holder 07150013)	**00402239**
Validated C18, NewGuard®, 15 x 3.2 mm (requires NewGuard Holder 07150001)	**00402237**
100 mm NewGuard System Holder (For direct coupling of NewGuard and 100 mm cartridge)	**07150016**
Union (For direct coupling of two cartridges)	**07150018**

Note: *See page LC-33 for additional MPLC holders.*



Performance of Validated Column with basic, acidic, and neutral test probes.



Comparative test results of columns packed with three different silica lots for a USP assay of chlorthalidone. The chromatogram of a degraded bulk sample (1 mg/mL) shows the presence of an unidentified impurity, chlorthalidone, its hydrolysis product, 4'-chloro-3'-sulfamoyl-2-benzophenone carboxylic acid (CCA) and a degradation product, 2-chloro-5- (1-methoxy-3-oxo-1-isoindoliny)-benzenesulfonamide (CBSA).

HPLC Columns

CHOICE™ Columns for LC/MS

1.800.762.4000 US

COLUMNS FOR LC/MS

The CHOICE columns provide the speed and efficiency appropriate for LC/MS. Their separation requirements vary depending on their system, sample, and their mass spectrophotometer.

PFPP for Separating Basic Drugs for LC/MS

Penta Fluoro Phenyl Propyl (PFPP) phase is ideal for *basic* drug separation prior to mass spectrometry. This bonded phase has been shown to efficiently separate basic drugs in a 90% Acetonitrile/water mobile phase, eliminating the interference of ion-pairing reagents and ion-suppressing agents normally used for these separations on C18.[1,2]

References:

[1] *S.R. Needham, et.al. Rapid Commun. in Mass Spectrom., 13, 2231-2236 (1999)*

[2] *S.R. Needham, et.al. J. Chromatogr, A 869 (2000) 159-170*

Columns for LC/MS

A single quadrapole MS user may require a much better chromatographic separation than a triple quadrapole MS. The matrix below illustrates the wide variety of column dimensions for the different chromatographic needs. Shorter length columns allow for faster separations. Smaller internal diameters (i.d.) offer higher sensitivity for smaller sample concentration. A longer column will be better suited to more complicated mixtures or where resolution may be difficult. If sample size is a concern; use a column with a smaller internal diameter; 2.1 mm or 3.2 mm, since this will provide greater sensitivity. There are four levels of efficiency/capacity to choose from:

Type of Spectrometer:	Triple or Single quad	Single quad	Triple quad	Triple quad
User Needs:	moderate efficiency low capacity high throughput	better efficiency medium capacity	best efficiency medium capacity	high efficiency high capacity
Column Recommondation:	20 x 3.2, 3 µm	30 x 2.1, 3 µm 30 x 4.6, 5 µm	50 x 3.2, 3 µm 50 x 3.2, 5 µm	50 x 4.6, 5 µm

Specifications

Description	Particle Size	Pore Diameter	Surface Area (M^2/G)	% Carbon	End Cap
CHOICE C18 3 µ	3 µm	100 Å	350	12%	Yes
CHOICE C8 3 µ	3 µm	100 Å	350	7%	Yes
CHOICE C18 5 µ	5 µm	100 Å	350	12%	Yes
CHOICE PFPP, 5 µ	5 µm	100 Å	320	5%	Yes

CHOICE Columns

Description	20 x 3.2 mm i.d., 1 per pkg. (Requires holder 7150001) Part No.	20 x 3.2 mm i.d., 3 per pkg. (Requires holder 7150001) Part No.	30 x 2.1 mm i.d., 1 per pkg. (Requires holder 7150013) Part No.	30 x 4.6 mm i.d., 1 per pkg. (Requires holder 7150013) Part No.	50 x 3.2 mm i.d., 1 per pkg. (Requires holder N2580030) Part No.	50 x 4.6 mm i.d., 1 per pkg. (Requires holder N2580030) Part No.
CHOICE C18, 3 µm			N2580002		N2580003	
Pecosphere C18, 3 µm	N2580000	N2580001				
CHOICE C8, 3 µm			N2580012		N2580013	
Pecosphere C8, 3 µm	N2580010	N2580011				
CHOICE C18, 5 µm				N2580020	N2580022	N2580021
CHOICE PFPP, 5 µm			N2580042			

Note: *See page LC-33 for additional MPLC holders.*

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VeloSep® Columns and Brownlee™ Preparative Columns

- VeloSep columns are 3.2 mm i.d. cartridges packed with 3 µm reversed-phase support for high throughput analysis and reduced solvent consumption.
  - – Improve sensitivity and speed while cutting solvent consumption by half.
  - – Packed with 3 µm C8 or C18 sorbents.
  - – Available in 40 mm or 100 mm lengths.
- Preparative columns are 10 mm i.d. cartridges, packed with Aquapore® 20 µm, 300 Å sorbents.
  - – Easy scale-up from the Aquapore analytical columns using similar bonded phase.
  - – Available in 30 mm, 100 mm, and 250 mm cartridges.
  - – The unique 100 mm and 250 mm cartridge design incorporates a moveable inlet plug and filter which compensates for changes in bed volume with use.
  - – Typical sample capacity of the 250 mm cartridge is 50 mg to 1 g of material (depending on resolution and purity requirements). The typical flow rate is 4-10 mL/min.
  - – Save time with high-pressure preparative runs up to 3000 psi.
  - – Achieve high performance with the 20 µm, 300 Å sorbents optimized for bioseparations.

Prep-10 Cartridges

Specifications

Product	Functionality	Pore Diameter	Surface Area (M^2/G)	% Carbon	End Cap
RP-8, VeloSep	Octyl (C8)	100 Å	170	7%	Yes
RP-18, VeloSep	Octadecyl (C18)	100 Å	170	14%	Yes

VeloSep Columns

Description	40 mm Cartridge 3.2 mm i.d., 2 per pkg. (Requires holder 07150013) Part No.	100 mm Cartridge 3.2 mm i.d. (Requires holder 07150014) Part No.
RP-8, VeloSep 3 µm, C18, 100 Å	07110189	07110190
RP-18, VeloSep 3 µm, C18, 100 Å	07110191	07110192

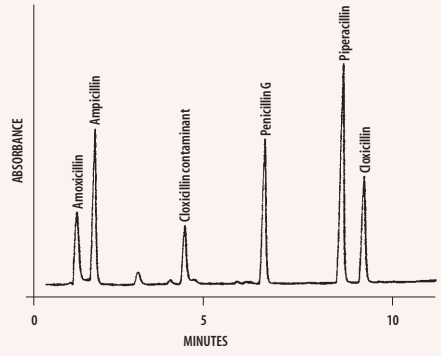
Specifications

THE AQUAPORE PREPARATIVE SORBENTS ARE SPHERICAL 20 µM SILICA-BASED SORBENTS.

Product	Functionality	Pore Diameter	Surface Area (M^2/G)	% Carbon	End Cap
Aquapore Octyl	Octyl (C8)	300 Å	100	5%	Yes
Aquapore ODS	Octadecyl (C18)	300 Å	100	10%	Yes

Preparative Columns

Description	30 mm Cartridge 10 mm i.d. (Requires holder 07150004) Part No.	100 mm Cartridge 10 mm i.d. (Requires holder 07150005) Part No.	250 mm Cartridge 10 mm i.d. (Requires holder 07150006) Part No.
Aquapore Octyl, 20 µm, 300 Å	07110164	07110165	07110166
Aquapore ODS, 20 µm, 300 Å	07110108	07110114	07110163

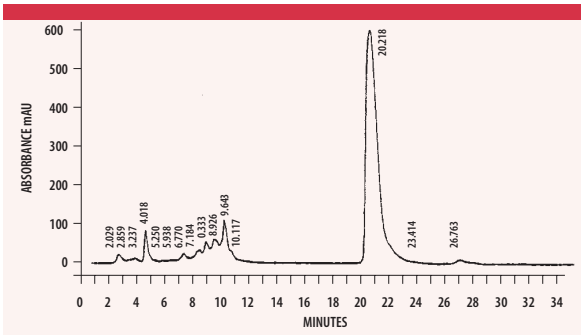


Analysis of Penicillins. VeloSep RP-18, 3 µm, 100 x 3.2 mm.

Conditions: Solvent A: 10 mM sodium phosphate pH 6.5. Solvent B: 50% isopropyl alcohol in water.

Gradient: 5-50% B in 10 min.

Flow: 0.5 mL/min. Temp: 5° C, 230 nm.



Purification of synthetic trityl-on oligonucleotides. Aquapore Octyl, 20 µm. 250 x 10 mm.

Conditions: Buffer A: 100 mM triethylammonium acetate pH 7.6. Buffer B: 80% acetonitrile in Buffer A.

Gradient: 10-45% B in 35 minutes.

Sample: 0.25 µ mole DNA material.

Flow Rate: 5.0 mL/min. Ambient. 260 nm.

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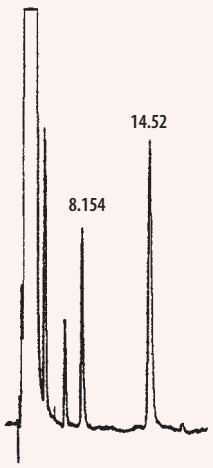
HPLC Columns

NewGuard® Columns, Replacement Seals, and Test Mixes

1.800.762.4000 US

- NewGuards are small guard cartridges (15 mm x 3.2 mm i.d.) packed with 5 µm or 7 µm sorbents. NewGuard cartridges prolong column life by eliminating particulates, contaminants, and strongly bound sample components. They act as replaceable, disposable heads of your analytical columns. There is negligible loss of efficiency and little effect on retention or resolution. NewGuards are available in a convenient 3-pack and can be coupled directly to any MPLC® cartridge with a union (07150018).
  - Prolong column life by 2-5 fold.
  - Protect your column from particulates and strongly bound sample components.
  - Optimized dimensions to prevent loss of resolution.
  - Easy coupling to MPLC cartridges or conventional columns.
  - Finger-tight seal to 7000 psi using NewGuard holders.
  - Can be used for sample preconcentration (connected to sample injection loop).



Simultaneous determination of trimethoprin and sulfamethoxazole using NewGuard RP-18 cartridge with Spheri-5 RP-18. 220 x 4.6 mm column.

Conditions: 80% water, 20% acetonitrile, ambient temperature.

Flow Rate: 1 mL/min.

Courtesy of Dopharma Research and Inacom.

NewGuard Columns

Description	15 mm cartridge, 3.2 mm i.d., 3 per pkg. (Requires holder 07150001) Part No.
Validated®, C18, 5 µm spherical	00402237
RP-2, Aquapore® Dimethyl, 7 µm spherical	07110086
RP-4, Aquapore Butyl, 7 µm spherical	07110088
RP-8, Aquapore Octyl, 7 µm spherical	07110090
RP-18, Aquapore ODS, 7 µm spherical	07110092
Phenyl, Aquapore Phenyl, 7 µm spherical	07110096
Amino, Aquapore Amino, 7 µm spherical	07110098
Cyano, Aquapore Cyano, 7 µm spherical	07110100
Anion, Aquapore Anion, 7 µm spherical	07110102
Cation, Aquapore Cation, 7 µm spherical	07110104
Diol, Aquapore Diol, 7 µm spherical	07110105
Silica, Aquapore Silica, 7 µm spherical	07110106

Note: *Actual bed length of NewGuard is about 13 mm.*

Replacement Seals for MPLC and Prep-10 Holders

Item	Description	Part No.
Seal Replacement Kit for MPLC Holders	Tools and two 7000 psi seals.	07150023
Seals for MPLC Holders	Two 7000 psi seals. (Seal Replacement Kit tools required.)	07150024
Prep-10 Seal Replacement Kit	Tools only. Seals not included.	07150011
Prep-10 Inlet Seal	One each. (Prep-10 Seal Replacement Kit tools required.)	07150012
Prep-10 Outlet Seal	One each. (Prep-10 Seal Replacement Kit tools required.)	07150026

HPLC Test Mixes

Description	Part No.
Universal test mix for reversed-phase (5 mL/pkg.)	00890893

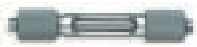
NewGuard cartridges directly coupled to a 220 mm MPLC cartridge and connected externally to a 250 mm conventional column.

View of the NewGuard holder and a NewGuard 3/pack.

MPLC® Cartridge Hardware

- The patented MPLC cartridge system ensures leak-free operation up to 7000 psi, with only finger- tightening. The high-pressure seal in each end assembly actually seals tighter as pressure increases. No wrenches are required, and there is no need to disconnect any tubing to your LC system when changing a cartridge. Each MPLC cartridge can be directly coupled to another using a union.

MPLC/Peco™ Holders

		Description	Part No.
Universal Holder Kit		Includes 100 mm and 220 mm holder bodies, 2 end assemblies, 1 union, 1 NewGuard end assembly.	07150025
NewGuard® Holder		Holds a single NewGuard cartridge or a single 20 mm CHOICE™ cartridge.	07150001
30 mm Holder		Holds a single MPLC and CHOICE 30 mm cartridge.	07150013
30 mm Peco Holder		Holds 30 mm Fast LC Peco cartridge only.	07150028
50 mm Holder		Holds a single 50 mm CHOICE cartridge only.	N2580030
80 mm Peco Holder		Holds 80 mm Fast LC Peco cartridge only.	07150029
100 mm Holder		Holds a single MPLC 100 mm cartridge.	07150014
150 mm Holder		Holds a single MPLC 150 mm cartridge.	07150030
220 mm Holder		Holds a single MPLC 220 mm cartridge.	07150015
250 mm Holder		Holds a single MPLC 250 mm cartridge.	07150031
100 mm NewGuard System Holder		Holder for a NewGuard and a 100 mm coupled cartridge.	07150016
220 mm NewGuard System Holder		Holder for a NewGuard and a 220 mm coupled cartridge.	07150017
130 mm MPLC System Holder		Holder for a 30 mm and a 100 mm coupled cartridge.	07150032
Union		For direct coupling of 2 cartridge holders. (Two holder bodies and 2 end assemblies also required.)	07150018
NewGuard End Assembly		Upgrades a 30 mm holder to a NewGuard holder.	07150002
End Assembly		Holder component.	07150019
30 mm Holder Body		Holder component.	07150020
100 mm Holder Body		Holder component.	07150021
220 mm Holder Body		Holder component.	07150022

Prep-10 Cartridge Holders

		Description	Part No.
30 mm Prep-10 Holder		Holds a single 30 mm Prep-10 guard cartridge.	07150004
100 mm Prep-10 Holder		Holds a single 100 mm Prep-10 cartridge.	07150005
250 mm Prep-10 Holder		Holds a single 250 mm Prep-10 cartridge.	07150006

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HPLC Columns

Brownlee™ Conventional and Microbore Columns

1.800.762.4000 US

BROWNLEE CONVENTIONAL COLUMNS

- Conventional Brownlee Columns (noncartridge) use standard compression end fittings compatible with all HPLC instrumentation. These columns do not require MPLC® holders.
  - – End fittings compatible with HPLC systems from any vendors.
  - – Use with NewGuard® system (line connection) for even longer column life.
  - – Each column is individually tested.

Conventional columns do not require MPLC holders.

Reversed Phase

Description	250 mm Conventional Column 4.6 mm i.d. Part No.
RP-2, Spheri-10®, C2, 10 µm	07120005
RP-8, Spheri-5, C8, 5 µm	07120012
RP-18, Spheri-10, C18, 10 µm	07120001
RP-18, Spheri-5, C18, 5 µm	07120016
ODS, Spheri-5 C-18, polyfunctional, 5 µm	07120019
OD-300, Aquapore® ODS C-18, 7 µm, 300 Å	07120073
RP-300, Aquapore Octyl C-8, 7 µm, 300 Å	07120033

Polar Phase

Silica, Spheri-5 5 µm, 80 Å	07120023

Ion Exchange

AX-300, Aquapore 7 µm, 300 Å, Weak anion	07120040

BROWNLEE MICROBORE HPLC COLUMNS

- Microbore columns (1.0 mm i.d.) are ideal for the analysis of samples of limited availability (e.g., micropurification of picomole levels of proteins/peptides). Reducing the column diameter from the standard 4.6 mm to 1.0 mm increases the mass sensitivity by 20 times. Sample components can be collected in small elution volumes (1-50 µL) for further sequence or mass analysis. Microbore offers major benefits in pharmacokinetic assays and LC/MS applications. The typical flow rate range is 10-100 µL/min., therefore specialized HPLC systems may be required for optimum column performance.
  - – Increase sensitivity and decrease solvent consumption by a factor of 20 (compared with 4.6 mm i.d.).
  - – Reduce sample size for pharmacokinetic assays.
  - – Better compatibility with LC/MS interfaces.
  - – Each column is individually tested.

250 mm, 100 mm Microbore Columns (1.0 mm i.d.)

ORDERING INFORMATION

Description	100 mm Microbore 1.0 mm i.d., Part No.	250 mm Microbore 1.0 mm i.d., Part No.
RP-300, Aquapore 7 µm, C8, 300 Å	07120096	07120097
OD-300, Aquapore 7 µm, C18, 300 Å	07120099	

References:

R.P.W. Scott (Ed.), Small Bore LC Columns, John Wiley & Sons, New York, 1984.

R.J. Sawchuk and L.L. Cartier, "Simultaneous LC determination of carbamazepine in plasma," Clin. Chem., 28, 2127, 1982.

1.800.561.4646 Canada

Application Notes

Subject	App. Note.
Biotechnology	
Nucleosides and Bases	LCBIO-1
Nucleosides: Human Serum Profile	LCBIO-2
RPC: Separation of Proteins	LCBIO-17
Tryptic Digest of Glycoprotein Human IgA	LCBIO-21
2-D Purification of HIV Protease	LCBIO-22
Prep: Purification of Maganin Peptides.	LCBIO-25
Clinical	
Amphetamines.	LCCL-1
Analgesics (narcotics)	LCCL-2
Anticonvulsants	LCCL-3
Barbiturates	LCCL-4
Hallucinogens	LCCL-5
Opiates	LCCL-6
Theophylline	LCCL-7
Toxicology Screen of Abused Drugs	LCCL-8
Tricyclic Antidepressants	LCCL-9
Tricyclic Antidepressants	LCCL-10
Xanthines	LCCL-11
Environmental	
Phenol Priority Pollutants	LCENV-1
Benzidine	LCENV-2
Phthalate Esters in River Water	LCENV-3
Polychlorinated Biphenyls	LCENV-4
Food	
Aflatoxins in Peanuts	LCFD-1
Aflatoxins	LCFD-2
Amino Acids in Soy	LCFD-3
Fatty Acids (bromophenacyl esters)	LCFD-4
Food Dyes	LCFD-5
Non-nutritive Sweetener in Beverage	LCFD-6
Phenolic Acids in Beer	LCFD-7
Phenolic Antioxidants in Oils	LCFD-8
Phenols in Whiskey	LCFD-9
Piperine in Black Pepper	LCFD-10
Preservatives	LCFD-11
Tocopherols in Palm Oils	LCFD-15
Triglycerides	LCFD-16
Water-soluble Vitamins in Tablets	LCFD-18
Water-soluble Vitamins in Beverages	LCFD-19

Subject	App. Note.
Food (cont.)	
Water-soluble Vitamins in Animal Feeds	LCFD-20
Fat-soluble Vitamins in Animal Feeds.	LCFD-21
Sugar Analysis (amino column)	LCFD-22
Sugar Analysis (resin column)	LCFD-23
Organic Acids	LCFD-24
Capsaisins in Hot Peppers	LCFD-25
Analysis of Organic Acids	LCFD-26
Organic Acids, Sugars, and Ethanol in Grape Musts and Wine	LCFD-27
Organic Acids in Fruit Juice	LCFD-28
Analysis of Sugars	LCFD-29
Industrial	
Chemicals: Deuterated Benzene	LCIN-1
Epoxy Resin	LCIN-2
Fatty Acids (short-chain)	LCIN-3
Hexachlorophene	LCIN-4
Polystyrene Additives	LCIN-6
Analysis of Propellants	LCIN-7
Surfactants in Shampoo	LCIN-8
Terephthalic Acid in PET	LCIN-9
Pharmaceutical	
Analgesics in Tablets	LCPH-1
Analgesics/Anti-inflammatory.	LCPH-2
Antibiotics	LCPH-3
Antifungal Ingredient Pharm. Cream	LCPH-4
Antihistamines	LCPH-5
Benzodiazepines	LCPH-6
Cardiac Drugs	LCPH-7
Estrogenic Steroids.	LCPH-10
Hydrocortisone in Cream	LCPH-11
Parabens in Hand Cream	LCPH-12
Phenothiazines	LCPH-13
Prednisone	LCPH-14
Chlorthalidone Stability Testing	LCPH-15
Analgesic Tablet.	LCPH-16
Carbamazepine in Serum	LCPH-17
Cocaine and Metabolites in Serum	LCPH-18
LC/MS of Quinolone Antibiotic Degradation Products.	LCPH-19

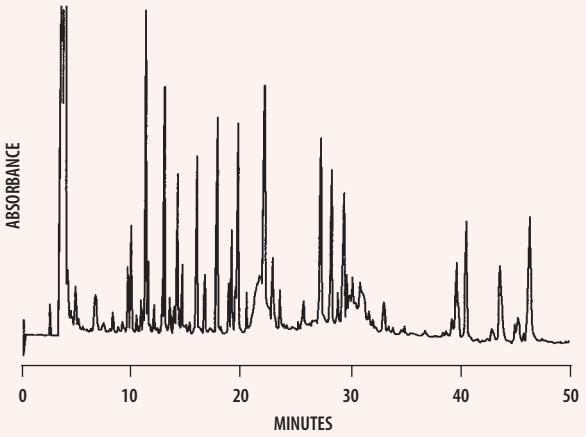
To receive application notes, contact PerkinElmer and request LC application note number.
Tel: (800)762-4000 (U.S. only) or (203)762-4000; Fax: (203)944-4904.
Internet: http://www.perkinelmer.com

www.perkinelmer.com/essentials

HPLC Applications

Biotechnology Applications

1.800.762.4000 US



Tryptic Map of Glycoproteins Human IgA

CHROMATOGRAPHIC CONDITIONS

Column: Aquapore RP-300 (7 µm, 300 Å, 220 x 2.1 mm) (07110060)

Detection: UV at 214 nm

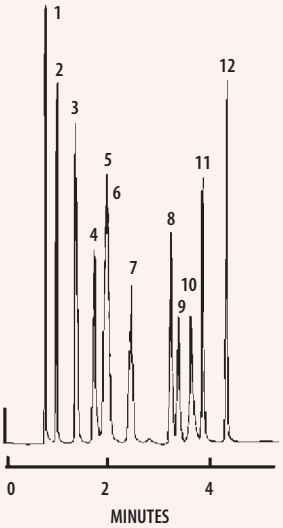
Mobile Phase: A: 0.1% TFA
B: 0.1% TFA in ACN

Flow Rate: 0.25 mL/min.

Gradient: 2-70% B in 45 min.

Sample: Tryptic digest of glycoprotein Human IgA 200 pmoles

Peak Identification
1. Cytosine
2. Uracil
3. Cytidine
4. Uridine
5. Hypoxanthine
6. Xanthine
7. Thymine
8. Inosine
9. Guanosine
10. Thymidine
11. Adenine
12. Adenosine



Nucleosides and Bases

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 5 C18 (150 x 4.6 mm, 5 µm) (02580169)

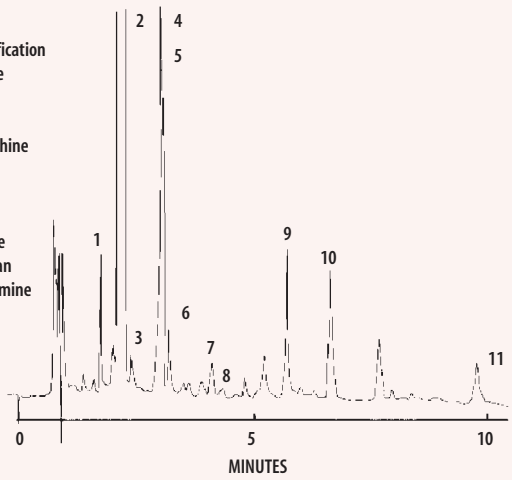
Detection: UV at 254 nm

Mobile Phase: A: 60% MeOH/H_2O
B: 0.02M NaH_2PO_4 in pH 5.5 aqueous buffer gradient 0.5% – 40% A in 3 min.

Flow Rate: 3.5 mL/min.

Pressure: 3,500 psi (24 MPa)

Peak Identification
1. Creatinine
2. Uric Acid
3. Tyrosine
4. Hypoxanthine
5. Undine
6. Xanthine
7. Inosine
8. Guanosine
9. Tryptophan
10. Theobromine
11. Caffeine



Human Serum Profile

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 5 C18 (150 x 4.6 mm, 5 µm) (02580169)

Detection: UV at 254 nm

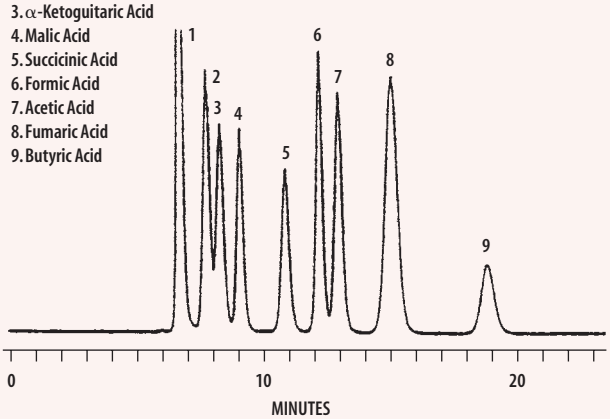
Mobile Phase: A: 60% MeOH/H_2O
B: 0.02 M NaH_2PO_4 in pH 5.6
Linear gradient from 0.5% – 40% A in 7 min.

Flow Rate: 2.0 mL/min.

Pressure: 2,200 psi (15 MPa)

Inj. Volume: 10 µL of deproteinized serum

Peak Identification
1. Oxalic Acid
2. Citric Acid
3. α-Ketoguitaric Acid
4. Malic Acid
5. Succicinic Acid
6. Formic Acid
7. Acetic Acid
8. Fumaric Acid
9. Butyric Acid



Organic Acids

CHROMATOGRAPHIC CONDITIONS

Column: Polypore H (220 x 4.6 mm i.d.) (07110089)

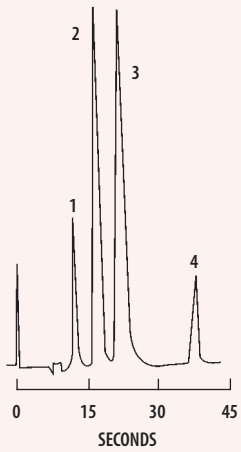
Detection: 210 nm

Mobile Phase: 0.01 N H_2SO_4

Flow Rate: 0.15 mL/min.

Temperature: 25° C

Peak Identification
1. Theobromine
2. Theophyline
3. ß-OH Ethyl Theophylline
4. Caffeine

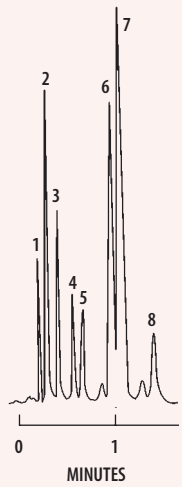


Theophylline

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere-3 x 3 C18 (33 x 4.6 mm i.d.) (02580164)
Detection: UV at 273 nm
Mobile Phase: 11% CH_3CN in H_2O
Flow Rate: 3.0 mL/min.
Sample: 6 µL injection: 1-10 mg/L standards

Peak Identification
1. Barbital
2. Phenobarbital
3. Aprobarbital
4. Butabarbital
5. Mephobarbital
6. Amobarbital
7. Pentobarbital
8. Secobarbital

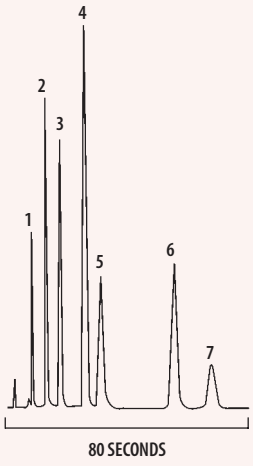


Barbiturates

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere-3 x 3 C18 (33 x 4.6 mm i.d.) (02580164)
Detection: UV at 200 nm
Mobile Phase: MeOH, 0.015 M $(NH_4)_2HPO_2$:H_2O (55:20:25)
Flow Rate: 2.5 mL/min.
Sample: 3 µL injection: 0.1 mg/mL of each barbiturate

Peak Identification
1. 1-Methylxanthine
2. Xanthine
3. Theobromine
4. Theophylline
5. Diphylline
6. Caffeine
7. ß-Chlorotheophylline

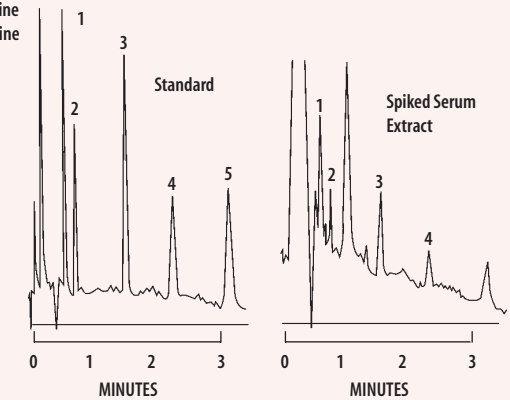


Xanthines and Metabolites

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere-3 x 3 C18 (33 x 4.6 mm i.d.) (02580164)
Detection: UV at 254 nm
Mobile Phase: 6/94 (v/v) acetonitrile/water containing 20 µL/L acetic acid
Flow Rate: 5 mL/min.
Sample: 10 µL injection vol.; 0.1 mg/mL of each compound

Peak Identification
1. Amitriptyline
2. Imipramine
3. Nortriptyline
4. Desipramine
5. Protriptyline



Tricyclic Antidepressants

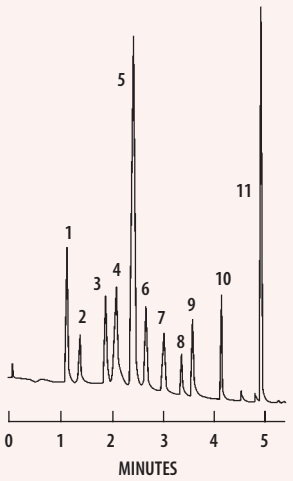
CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere-3 Silica (83 x 4.6 mm, 3 µm) (02580167)
Detection: UV at 210 nm
Mobile Phase: CH_3CN/MeOH/i-PrOH/NH_4OH (60:32:7.6:0.4)
Flow Rate: 4.5 mL/min.
Inj. Volume: Standard: 1.0 µL serum, extract: 10 µL

HPLC Applications

Environmental Applications

Peak Identification
1. Phenol
2. *p*-Nitrophenol
3. *o*-chlorophenol
4. 2,4-Dinetrophenol
5. *o*-Nitrophenol
6. 2,4 Dimethylphenol
7. 4-Chloro-*m*-Cresol
8. 2,4-dichlorophenol
9. 4,6-Dinitro-*o*-Cresol
10. 2,4,6-Trichlorophenol
11. Pentachlorophenol



Phenol Priority Pollutants

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 3 C18 (83 x 4.6 mm i.d., 3 µm) (02580166)

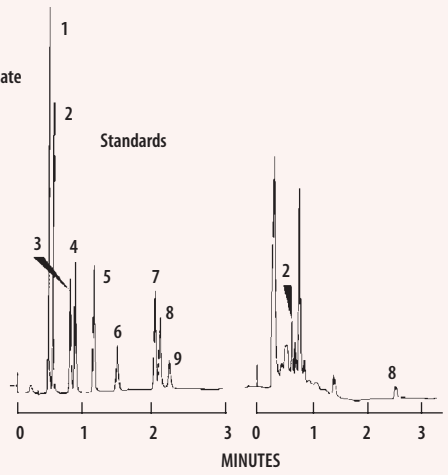
Detection: UV at 254 nm

Mobile Phase: Linear gradient of 35% acetonitrile/water (pH 2.2) to 100% acetonitrile in 4 min.

Flow Rate: 2.5 mL/min.

Inj. Volume: 6 µL injection volume; 0.1-0.2 mg/mL of each compound

Peak Identification
1. Dimethyl Phthalate
2. Diethyl Phthalate
3. Butyl Benzyl Phthalate
4. Dibutyl Phthalate
5. Dipentyl Phthalate
6. Dihexyl Phthalate
7. Di(2-Ethylhexyl) Phthalate
8. Dioctyl Phthalate
9. Dinonyl Phthalate



Phthalate Esters in River Water

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 3 C18 (83 x 4.6 mm i.d., 3 µm) (02580166)

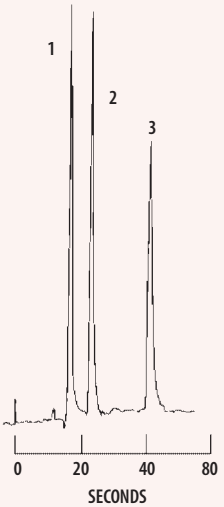
Detection: UV at 275 nm

Mobile Phase: Linear gradient of 85% acetonitrile/water 1000/0 acetonitrile in 1 min.

Flow Rate: 3.5 mL/min.

Pressure: 3,800 psi (26 MPa)

Peak Identification
1. Benzidine
2. Dichlorobenzidine
3. Diphenylhydrazine



Benzidine

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 3 C18 (83 x 4.6 mm, 3 µm) (02580166)

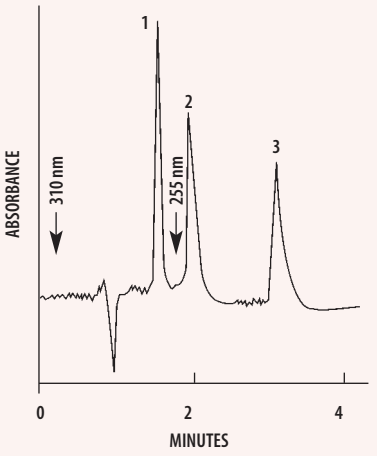
Detection: UV at 280 nm

Mobile Phase: 80% acetonitrile/water (pH 4,7)

Flow Rate: 6.0 mL/min.

Pressure: 5,000 psi (36 MPa)

Peak Identification
1. Diquat
2. Paraquat
3. Ethylparaquat (internal standard)



Diquat and Paraquat

CHROMATOGRAPHIC CONDITIONS

Column: Two Pecosphere 3 x 3, silica (83 x 4.6 mm i.d., 3 µm) (02580167)

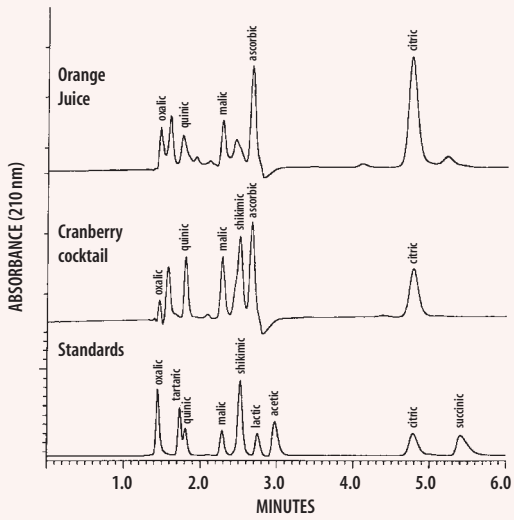
Detection: UV at 310 for diquat and 255 for paraquat

Mobile Phase: Tetramethyl ammonium hydroxide 10 g/L, ammonium sulfate 30 g/L (in water)

Flow Rate: 0.8 mL/min.

Sample: 10 ng per component

Temperature: 70° C



Analysis of Organic Acids in Fruit Juice Using Reversed-phase Columns

CHROMATOGRAPHIC CONDITIONS

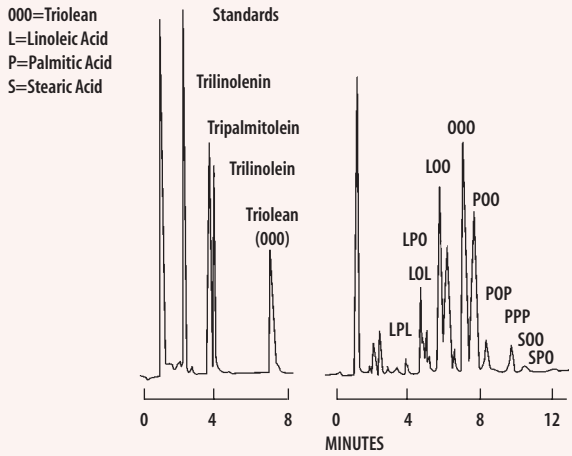
Column: Spheri-5 RP-18 (220 x 4.6 mm, 5 µm) (07110017)

Detection: UV at 210 nm

Mobile Phase: 25 mM KH_2PO_4 at pH 2.4, purge with 30% ACN for 1 min. then equilibrate for 10 min.

Flow Rate: 1.5 mL/min. at room temperature, pressure 2,400 psi

Sample: 5 µL of beverage sample diluted 1:4 in mobile phase



Olive Oil Triglycerides

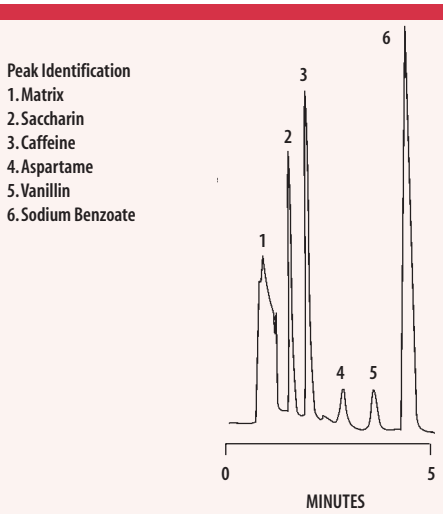
CHROMATOGRAPHIC CONDITIONS

Columns: Two PerkinElmer Pecosphere 3 x 8 C18 columns connected in series (83 x 4.6 mm i.d., 3 µm) (02580166)

Detection: Refractive Index

Mobile Phase: Acetone/Acetonitrile (70:30)

Flow Rate: 2.5 mL/min.



Sweeteners and Additives in Beverages

CHROMATOGRAPHIC CONDITIONS

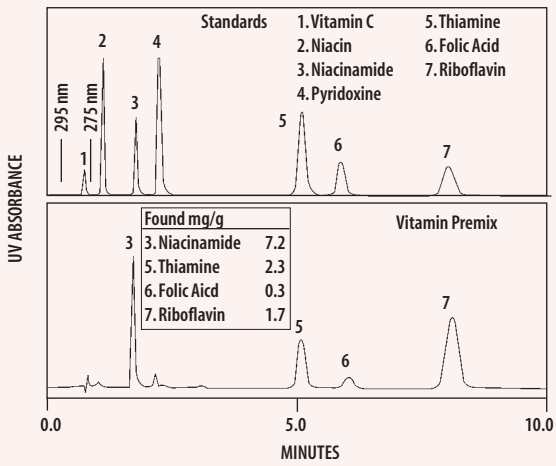
Column: Pecosphere 5 x 15 C18 (150 x 4.6 mm i.d., 5 µm) (02580169)

Detection: UV at 254 nm

Mobile Phase: 45% A in B
A: Methanol
B: Water with 0.7 g m/L hexane sulfonic acid & H_3PO_4 to pH 2.1

Flow Rate: 1.5 mL/min.

Sample: 5 µL injection of carbonated beverage product



Water-soluble Vitamins in Animal Feed Premix

CHROMATOGRAPHIC CONDITIONS

Column: PerkinElmer Reduced-activity 3 µm C8 column (83 mm x 4.6 mm i.d.) (N9303392)

Detection: UV absorbance at 275 nm

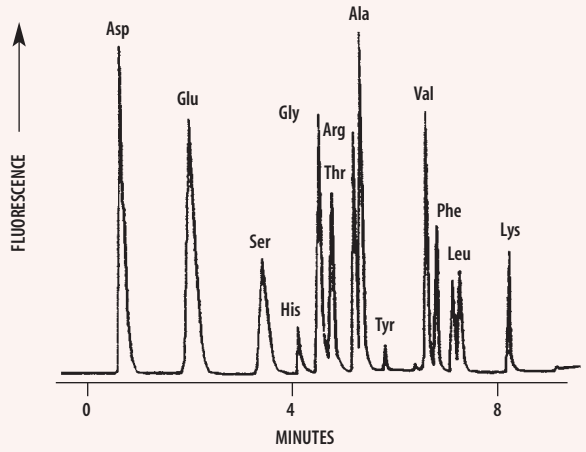
Mobile Phase: 15% methanol, 85% [10 mM hexanesulfonate (Sigma), 1% acetic acid, 0.13% triethylamine in water]

Flow Rate: 1.5 mL/min. at 35° C

Sample: Animal feed premix

HPLC Applications

Food Applications



Analysis of OPA Precolumn Derivatives of Amino Acids

CHROMATOGRAPHIC CONDITIONS

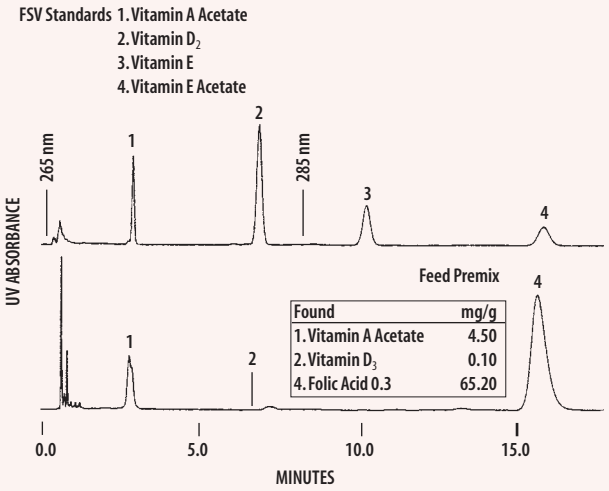
Column: Pecosphere 3 x 3 C18 (33 x 4.6 mm i.d., 3 µm) (02580164)

Detection: Fluorescence 340 nm (Ex)/450 nm (Em)

Mobile Phase: A: Methanol
B: 1.5% THF in 50 mM NaOAc (pH 5.9)
Linear gradient of 5% A to 80% A in 6.5 min.

Flow Rate: 2.5 mL/min.

Sample: Soy protein hydrolyzate sample derivatized with OPA



Analysis of Fat-soluble Vitamins in Animal Feed Premix

CHROMATOGRAPHIC CONDITIONS

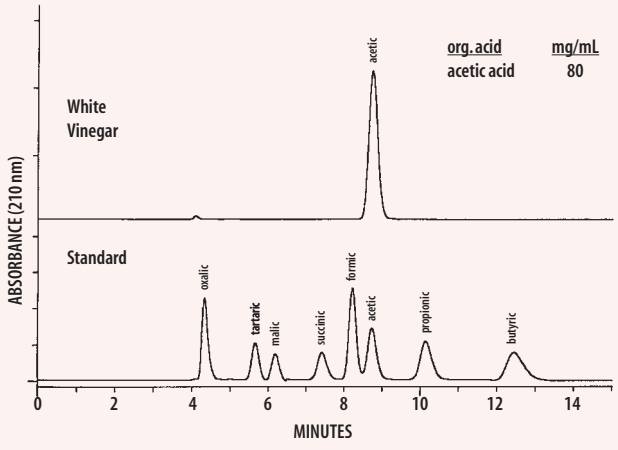
Column: Reduced-activity 3 µm C18 column
(83 mm x 4.6 mm i.d., 3 µm) (N9303394)

Detection: UV absorbance at 265/285 nm

Mobile Phase: 92% methanol/water

Flow Rate: 1.5 mL/min. at 35° C

Sample: Animal feed premix



Analysis of Organic Acids

CHROMATOGRAPHIC CONDITIONS

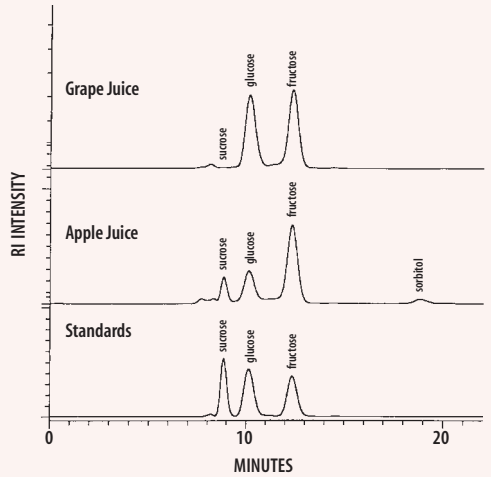
Column: Polypore H (220 x 4.6 mm, 10 µm) (07110089) with
Polypore H guard column (30 x 4.6 mm) (07110085)

Detection: UV at 210 nm

Mobile Phase: 0.01N H_2SO_4

Flow Rate: 0.3 mL/min. at room temp., 300 psi

Sample: 5 µL of standard or vinegar sample diluted 1:4 in mobile phase



Analysis of Sugars

CHROMATOGRAPHIC CONDITIONS

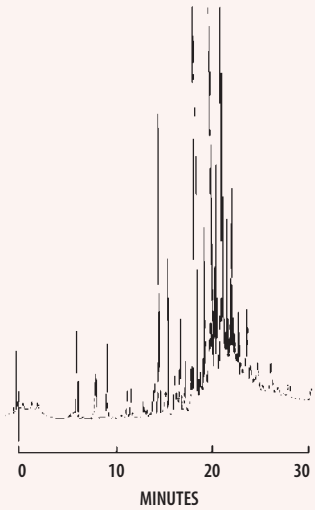
Column: Polypore CA (220 x 4.6 mm, 10 µm) (07110095) with
Polypore CA guard column (30 x 4.6 mm) (07110091)

Detection: RI

Mobile Phase: Water

Flow Rate: 0.2 mL/min. at 75° C, 100 psi

Sample: 10 µL of standard or juice sample diluted 1:4 in water



Epoxy Resin

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 3 C18 (83 x 4.6 mm, 3 µm) (02580166)

Detection: UV at 230 nm

Mobile Phase: Linear gradient of 40% acetonitrile/water to 100% acetonitrile in 30 min.

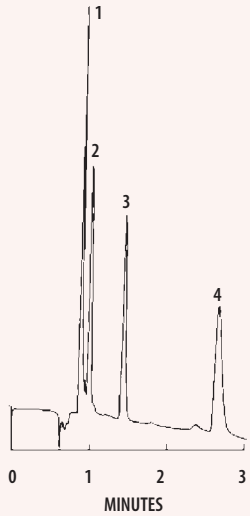
Flow Rate: 2.5 mL/min.

Pressure: 4,300 psi (30 MPa)

Temperature: Ambient

Inj. Volume: 6 µL

Peak Identification
1. Formic Acid
2. Acetic Acid
3. Propionic Acid
4. Butyric Acid



Short-chain Fatty Acids

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 5 C18 (150 x 4.6 mm, 5 µm) (02580169)

Detection: UV at 220 nm

Mobile Phase: 10% CH_3CN in water (pH 2.0)

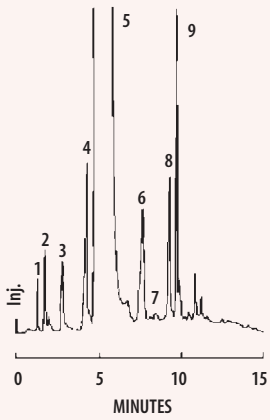
Flow Rate: 2.0 mL/min.

Pressure: 2,600 psi (18 MPa)

Temperature: Ambient

Inj. Volume: 10 µL

Peak Identification
1. Unknown
2. Tri-Chlorophenol
3. Unknown
4. Mixed Bis-Pheno
5. Hexachlorophene
6. Unknown
7. Unknown
8. 8-Chloro-Trimer
9. 9-Chloro-Trimer



Hexachlorophene

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 3 C18 (83 x 4.6 mm, 3 µm) (02580166)

Detection: UV at 300 nm

Mobile Phase: A: CH_3CN
B: 1% CH_3COONH_4 in MeOH/H_20 (77:23)
Concave gradient from 0.1% A to 40% A in 9 min.

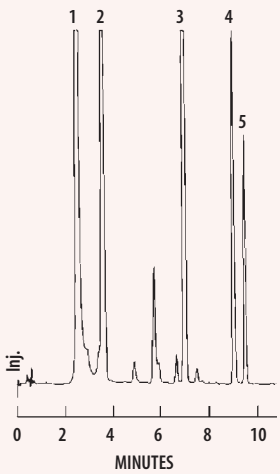
Flow Rate: 1.8 mL/min.

Pressure: 4,300 psi (30 MPa)

Temperature: Ambient

Inj. Volume: 20 µL

Peak Identification
1. Acetophenone
2. Cumyl Alcohol
3. Methyl Styrene
4. Santonox
5. Dicumyl Peroxide



Polystyrene Additives

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 5 C18 (150 x 4.6 mm, 5 µm) (02580169)

Detection: UV at 254 nm

Mobile Phase: Linear gradient of 25% acetonitrile/water to 100% acetonitrile in 10 min.

Flow Rate: 3.0 mL/min.

Pressure: 3,200 psi (8 MPa)

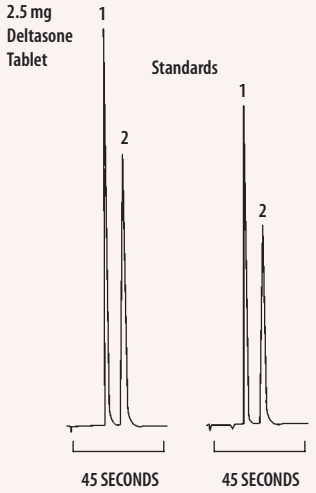
Temperature: Ambient

Inj. Volume: 6 µL

HPLC Applications

Pharmaceutical Applications

Peak Identification
1. Acetanilide
2. Prednisone

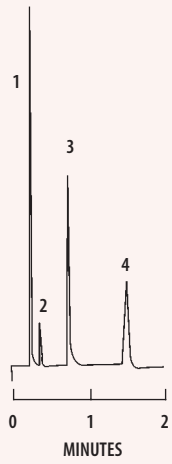


Prednisone in Tablet Preparations

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 3 x 8 C18 (83 x 4.6 mm i.d.) (02580166)
Detection: UV at 254 nm
Mobile Phase: 50/50 v/v methanol/water
Flow Rate: 2 mL/min.
Inj. Volume: 10 µL

Peak Identification
1. Acetaminophen
2. Caffeine
3. Salicylamide
4. Acetylsalicylic Acid

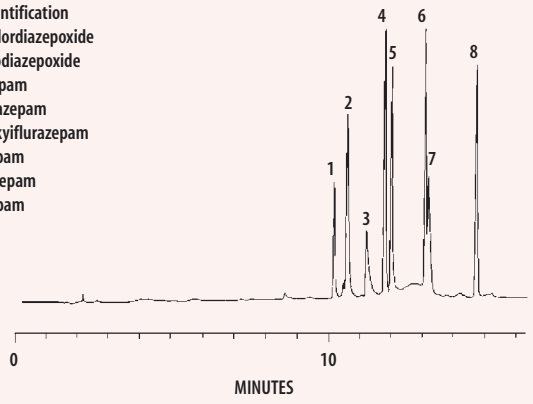


Analgesics in Tablets

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 3 x 8 C18 (33 x 4.6 mm i.d.) (02580166)
Detection: UV at 250 nm
Mobile Phase: 15% CH_3CN in 0.1% H_3PO_4
Flow Rate: 2.0 mL/min.
Inj. Volume: 1 µL of tablet extract

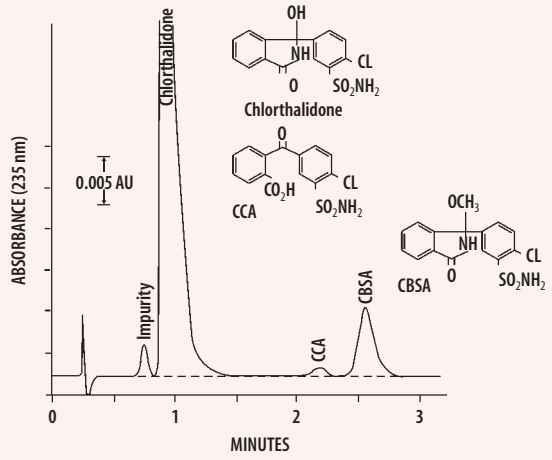
Peak Identification
1. Norchlordiazepoxide
2. Chlorodiazepoxide
3. Oxazepam
4. Nordiazepam
5. Desalkyiflurazepam
6. Diazepam
7. Flurazepam
8. Prazepam



Benzadiazepines

CHROMATOGRAPHIC CONDITIONS

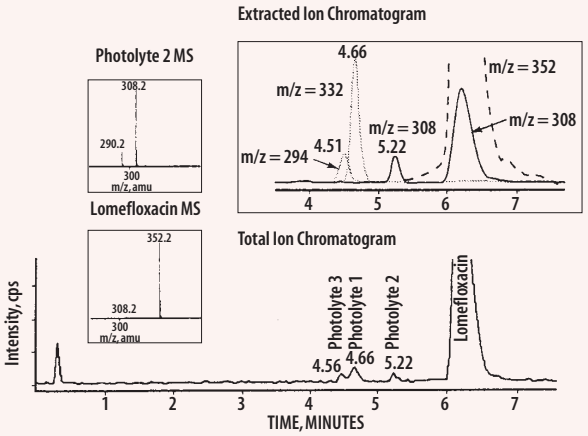
Column: Brownlee RP-8 Spheri-5 (220 x 2.1 mm) (07110006)
Detection: UV at 200 nm
Mobile Phase: A: 0.08% Diethylamine 0.08% Phosphoric Acid 90% Acetonitrile
B: 0.08% Diethylamine 0.09% Phosphoric Acid pH 2.3
Gradient: 5% A for 2 min.; 5% – 100% A in 15 min.; 100% A for 5 min.
Flow Rate: 0.5 mL/min.
Temperature: 50° C



Chlorthalidone HPLC Assay

CHROMATOGRAPHIC CONDITIONS

Column: Reduced activity C18 (33 x 4.6 mm i.d.) (N9303395)
Detection: UV at 235 nm
Mobile Phase: MeOH:H_2O:HOAc (34:65:1)
Flow Rate: 1.5 mL/min.
Temperature: 30° C



The LC/MS Identification and Quantitation of Quinolone Antibiotic Degradation Products

CHROMATOGRAPHIC CONDITIONS

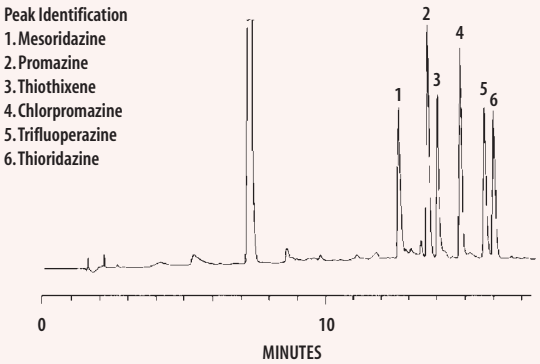
Column: Reduced Activity C18 (33 x 4.6 mm, 3-µm) (N9303395)

Detection: LC/MS with IonSpray (pneumatically assisted electrospray)

Mobile Phase: Solvent A: 95% water, 0.1% formic acid, 5% MeOH
Solvent B: 95% MeOH, 0.1% formic acid, 5% water
0-12% B (convex, program 4) in 5 min., hold 5 min.

Flow Rate: 1 mL/min. – split 65 mL/min. to MS, the rest to UV detector

Sample: A partially degraded sample of Lomefloxacin (25 µg/mL) after irradiation for 10 min. Note photolyte 2 is only at ~0.5% level.



Phenothiazines

CHROMATOGRAPHIC CONDITIONS

Column: Brownlee RP-8 Spheri-5 (220 x 2.1 mm) (07110006)

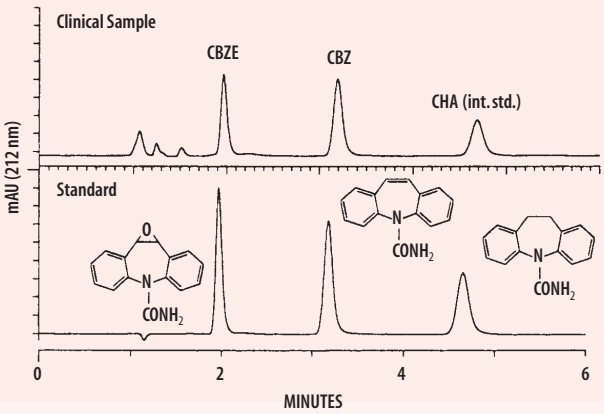
Detection: UV at 200 nm

Mobile Phase: A: 0.08% Diethylamine 0.08% Phosphoric Acid 90% Acetonitrile
B: 0.08% Diethylamine 0.09% Phosphoric Acid pH 2.3

Gradient: 5% A for 2 min.; 5% – 100% A in 15 min.; 100% A for 5 min.

Flow Rate: 0.5 mL/min.

Temperature: 50° C



Carbamazepine in Serum

CHROMATOGRAPHIC CONDITIONS

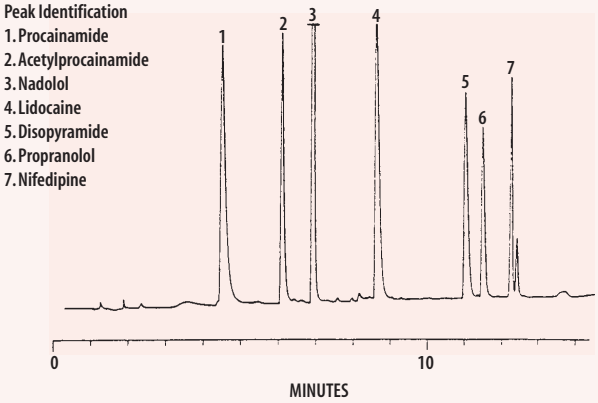
Column: Validated C18 (100 x 4.6 mm i.d.) (00402241)

Detection: 212 nm

Mobile Phase: 55% MeOH/H_2O

Flow Rate: 1.0 mL/min.

Sample: 2 µL of standard at 10 ng/µL
2 µL of clinical serum extract



Cardiac Drugs

CHROMATOGRAPHIC CONDITIONS

Column: RP-8 Spheri-5 (220 x 2.1 mm) (07110006)

Detection: UV at 200 nm

Mobile Phase: A: 0.08% Diethylamine 0.08% Phosphoric Acid 90% Acetonitrile
B: 0.08% Diethylamine 0.09% Phosphoric Acid pH 2.3

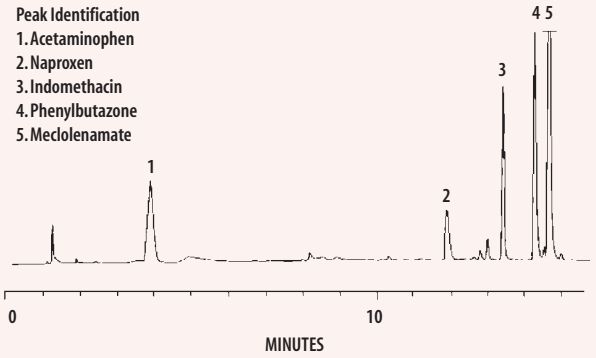
Gradient: 5% A for 2 min.; 5% – 100% A in 15 min.; 100% A for 5 min.

Flow Rate: 0.5 mL/min.

Temperature: 50° C

HPLC Applications

Pharmaceutical Applications



Analgesic/Anti-Inflammatory

CHROMATOGRAPHIC CONDITIONS

Column: Brownlee RP-8 Spheri-5 (220 x 2.1 mm) (07110006)

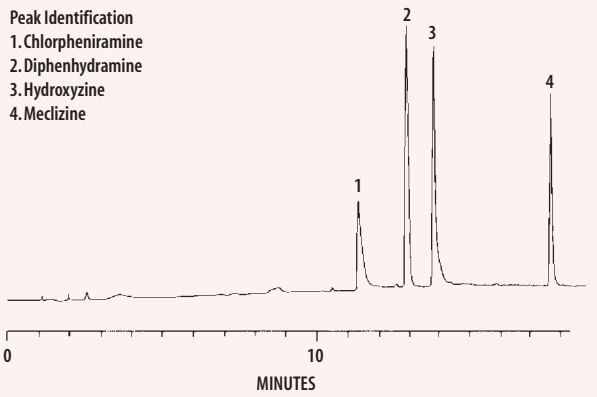
Detection: UV at 200 nm

Mobile Phase: A: 0.08% Diethylamine 0.08% Phosphoric Acid
90% Acetonitrile
B: 0.08% Diethylamine 0.09% Phosphoric Acid pH 2.3

Gradient: 5% A for 2 min.; 5% – 100% A in 15 min.; 100% A for 5 min.

Flow Rate: 0.5 mL/min.

Temperature: 50° C



Antihistamines

CHROMATOGRAPHIC CONDITIONS

Column: Brownlee RP-8 Spheri-5 (220 x 2.1 mm) (07110006)

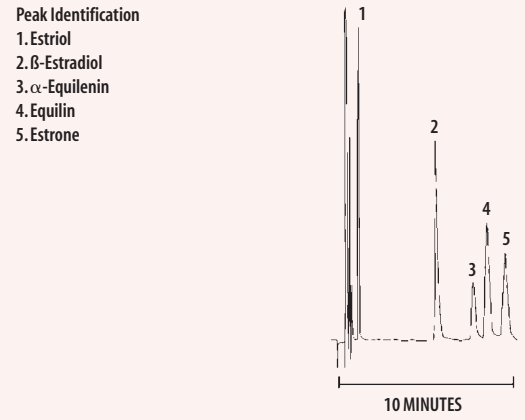
Detection: UV at 200 nm

Mobile Phase: A: 0.08% Diethylamine 0.08% Phosphoric Acid
90% Acetonitrile
B: 0.08% Diethylamine 0.09% Phosphoric Acid pH 2.3

Gradient: 5% A for 2 min.; 5% – 100% A in 15 min.; 100% A for 5 min.

Flow Rate: 0.5 mL/min.

Temperature: 50° C



Estrogenic Steroids

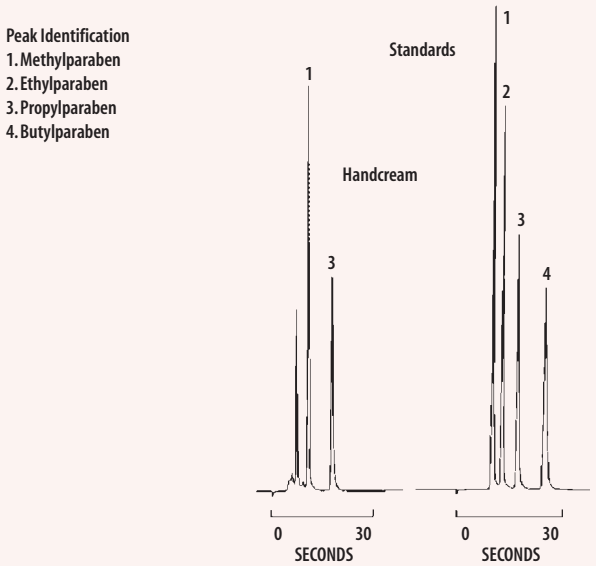
CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere-3CR C18 (4.6 x 83 mm) (02580194) coupled with a Pecosphere-3 x 3CR C18 (33 x 4.6 mm) (02580195)

Detection: UV at 280 nm

Mobile Phase: 33/67 v/v ACN/(0.5 M Phosphate Buffer Monobasic, 0.1% TEA adjusted to pH 4)

Inj. Volume: 10 µL



Parabens in Hand Cream

CHROMATOGRAPHIC CONDITIONS

Column: Pecosphere 3 x 3CR C18 (33 x 4.6 mm) (02580195)

Detection: UV at 254 nm

Mobile Phase: 50/50 v/v Methanol/H_2O

Flow Rate: 3 mL/min.

Inj. Volume: 10 µL

PerkinElmer offers a variety of stainless steel, titanium, and polymer based nuts, ferrules, unions, and tubing for plumbing the components of your LC system.

Stainless steel nuts are available in both Parker-Hannifin and Rheodyne formats. The nuts are used to connect 1/16 in. o.d. stainless steel tubing and feature a 10-32 thread size. PerkinElmer also offers select SSI fittings for 1/16 in. o.d. tubing in 1/4-28 thread size.

For biocompatible applications, both plastic and Isopure titanium fittings are available. PerkinElmer has created a Biocompatible Column Fittings Kit which contains fittings of various inert materials, such as PEEK and Tefzel®.

LC Fittings Kits

Fittings Kit for LC
All-in-one fittings kit. The kit contains Rheodyne and SSI nuts and ferrules as well as Fingertight II nuts and ferrules for toolless installation. Zero-dead-volume and low-dead-volume unions are also included. In addition, you receive varying lengths of stainless steel tubing in 0.007 in. i.d.s and 0.010 in. i.d.s, as well as 0.030 in. i.d. Tefzel tubing.

Part No. N9301002

Biocompatible Column Fittings for LC
Recommended for users of a PerkinElmer Biocompatible LC system. Contains nuts, ferrules, and unions.

Part No. N9301001

Operation Kit
Recommended for purchasers of their first LC. Includes tubing, union, fittings, syringe, basic LC book, and test mix.

Part No. 00890873

PEEK Union

The PEEK union allows you to connect two pieces of 1/16 in. tubing quickly and reliably. This union features a .012 in. thru-hole of minimum length for the lowest possible dead volume. Because this is a PEEK union, it is absolutely inert and biocompatible. The PEEK union comes without nuts.

Part No. ED020008 (pkg. 5)

PEEK One-piece Fingertight™ Fittings

This PEEK Fingertight is the toughest in regard to chemical resistance and pressure. This high-performance fingertight is recommended for the most demanding applications and will resist pressures up to 6000 psi (400 bar). The diameter of the head of the nuts has been increased by 50% to give you power enough to tighten without tools. The nut and ferrule are made from a single piece of PEEK.

Part No. ED020005 (pkg. 10)

Nuts and Ferrules. Parker-Hannifin male nuts are 1/16 in. Chemical Process Industry (CPI) standard nuts with a 10-32 thread size. These fittings are found in most connections in your PerkinElmer system. Rheodyne nuts and ferrules connect 1/16 in. o.d. stainless steel tubing to high-pressure injector valves. The thread size is 10-32.

LC Fittings

Description	Qty.	Part No.
Parker-Hannifin Nut and Ferrule Kit, 1/16 in.; six of each	1	00890945
Parker-Hannifin Ferrule, 1/16 in.	1	00873032
Parker-Hannifin Nut, 1/16 in.	1	09903980
SSI Nut and Ferrule Kit,1/16 in.: five nuts and 10 ferrules	1	02540273
Rheodyne Nut and Ferrule Kit, 1/16 in.: six ferrules, three short nuts, three long nuts.	1	02540274
Rheodyne Nut, 1/16 in.: long body	1	09904974
Rheodyne Nut, 1/16 in.: short body	1	09904956
Rheodyne Ferrule, 1/16 in.	1	09904947
Titanium Long Nut, 1/16 in.	1	N0911038
Titanium Short Nut, 1/16 in.	1	N0911028
Titanium Ferrule, 1/16 in.	1	N2601346
Fingertight II Male Nuts	10	N9301003
Fingertight II Ferrules	10	N9301004
Fingertight one-piece Nut and Ferrule	1	09920513
RheoFlex PEEK Nut and Ferrule Set	5	N9302676
RheoFlex PEEK Ferrules	5	N9302675
Tube Nut 410 Bio Pump	1	N2601149
Parker-Hannifin Zero-dead-volume Union, with nuts and ferrules	1	09903289
Swagelok Zero-dead-volume Union	1	09903807
Valco Nut, 1/16 in.	1	09903890
Valco Ferrule, 1/16 in.	1	09903891

LC Supplies and Accessories

Tubing and Filtration Systems

Clean-Cut™ For Cutting Polymeric Tubing

The Clean-Cut is designed to cut Teflon,® Tefzel®, and polymers in general, and PEEK capillary tubing in particular. The compact design enables every chromatographer to carry it in his pocket. A unique safety locking mechanism secures the blade when not in use. Suitable for dimensions from 1/16 in. to 1/8 in.

Part No. ED020015 (pkg. 1)

Replacement Blade

Part No. ED020016 (pkg. 10)

PEEK Tubing

PEEK tubing has the strength required to withstand continuous use at HPLC pressure without swelling or bursting. The dense polymer structure of PEEK tubing eliminates the permeability to organic solvents that causes other polymer tubing, such as Tefzel to "sweat."

Use PEEK tubing with virtually any organic or inorganic liquid. PEEK tubing is not affected by halide salts, high strength buffers or other aggressive mobile phases that degrade stainless steel.

PEEK Tubing
1/16 in. o.d. x .010 in. i.d., 5 ft.
Part No. N9302650

PEEK Tubing
1/16 in. o.d. x .007 in. i.d., 5 ft.
Part No. N9302678

Tubing Plier

For cutting 1/16 in. stainless steel capillaries. Annealed jaws with plastic handles. Avoids distortion of o.d. and closing the i.d.

Part No. ED020017 (pkg. 1)

Stainless Steel Tubing

SS-316 Tubing
1/16 in. o.d. x .043 in. i.d., 6 ft.
Part No. 00873035

SS-316 Tubing
1/16 in. o.d. x .015 in. i.d., 6 ft.
Part No. 00873036

SS-316 Tubing
1/16 in. o.d. x .007 in. i.d., 3 ft.
Part No. 02540838

SS-316 Tubing
1/16 in. o.d. x .007 in. i.d., 20 cm
Part No. 02711441

SS-316 Tubing
1/16 in. o.d. x .007 in. i.d., 50 cm
Part No. 00891480

Tefzel Tubing
1/16 in. o.d. x .030 in. i.d., 10 ft.
Part No. N9301029

Solvent and Sample Filtration

All-glass Filter Apparatus
For solvent filtration.
Part No. N9301063

FP Vericel Hydrophilic Filters
For aqueous mobile phase, 47 mm, 0.45 µm.
Part No. N9301067 (pkg. 100)

PTFE Hydrophobic Filters
For nonaqueous mobile phase, 47 mm, 0.45 µm.
Part No. N9301068 (pkg. 100)

Sample Filter Assembly
Acro LC-13 13 mm, 0.45 µm, for common reversed-phase solvents.
Part No. 02542783 (pkg. 100)

Sample Filter Assembly
Acrodisk CR-13 13 mm, 0.45 µm, for THF, DMSO, etc.
Part No. 02542782 (pkg. 100)

Rheodyne Injection Valves

The Rheodyne family of injection valves is the recognized standard for sample injection. PerkinElmer offers several Rheodyne models – each tailored to a specific application or injection volume range. Choose a manual injector if you plan to inject samples by hand or simply select a supported Rheodyne valve and quickly and easily install it in our Series 200 Autosampler for high-throughput analysis. PerkinElmer also supplies spare parts, syringes, and other consumable items to keep your system up and running.

Rheodyne 7725 Injection Valve

The Model 7725 and 7725i are Rheodyne's most advanced sample injectors for analytical HPLC. They can inject from 1 mL to 5 mL with high accuracy and precision. These versatile injectors can use either of two methods for loading the sample loop. The partial-filling method uses the syringe to measure the sample volume. It lets you vary volume easily without having to change the loop, and it does not waste any sample. Any amount up to half the loop volume can be loaded. The amount injected into the column is the exact volume dispensed from the syringe. The complete-filling method uses the loop to measure the volume. It lets you load the loop without having to read syringe calibrations carefully. Excess sample is required to completely flush mobile phase from the loop. The amount injected is the volume of the loop.

Flow switching occurs at a flat interface between a polymeric rotor seal and a ceramic stator face. This combination provides long seal life. In a clean system, the 7725 typically can make more than 30,000 injections before requiring replacement of the rotor seal.

The Models 7725 and 7725i are essentially identical, but the latter has a built-in position sensing switch, which can provide the chromatograph with a reproducible start signal.

These models are new versions of the popular Model 7125.

New features include:

- Flow is not interrupted during switching, a benefit when using flow-sensitive detectors, fragile columns, or pumps that are disturbed by pressure transients. A patented make-before-break or MBB™ passage makes new connections before old ones break.
- Wide port angles provide improved access to fittings.
- A front-end pressure screw makes it easy to adjust and maintain.
- A 2 mL internal sample loop is available. The new models use the same rotor seals as the 7125, but sample loops and some other parts are not interchangeable. These injectors are set for 5000 psi (345 bar, 34 MPa) and are adjustable to 7000 psi (483 bar, 48 MPa). Maximum temperature is 80° C. A 20 mL loop is attached when a complete valve is purchased.

7725i Injection Valve with Internal Switch
For stand-alone use.
Part No. N9306017

7725 Injection Valve
For use in the Series 200 Autosampler.
Part No. N9306019

Rheodyne 9725 PEEK Injection Valve

The Model 9725 is highly inert and well suited to the chromatography of biological molecules using all techniques, including those with aggressive mobile phases. It applies to both HPLC and soft gel chromatography, and is also suitable for ion chromatography, since metal does not contact the mobile phase. This injector is identical to the Model 7725 stainless steel injector, but the materials are different: the loop, nuts, ferrules, stator, and vent lines are made of PEEK, polyetheretherketone; the rotor seal polymer is Tefzel. PEEK has an outstanding combination of strength and inertness. The operating pH range is 0 to 14. The injector is set for its maximum pressure capability, 5000 psi (345 bar, 34 MPa). However, useable pressure may be lower, since the burst pressure of the PEEK sample loop usually limits it. Maximum temperature is 50° C. A 20 mL loop is attached.

The Rheodyne 9725 can quickly and easily be added to the PerkinElmer Series 200 Autosampler, making it an ideal sampling accessory for biochemistries. The Series 200 Autosampler also supports Peltier cooled sample trays for temperature labile samples (see page LC-1).

9725 Injection Valve
For use in the Series 200 Autosampler.
Part No. N9306020

Model 8125 Low-dispersion Stainless Steel Injection Valve

Ideal for use in an LC/MS system, the Model 8125 is designed for 1 mm and 2 mm microbore columns, and can be used also with conventional analytical columns (3 to 5 mm). It can inject sample volumes from 0.1 mL to 500 mL with zero sample waste, using the partial-filling method. Small flow passages produce low dispersion, maintaining the high mass sensitivity inherent in micro columns.

The 8125 Low-dispersion injector can quickly and easily be added to the PerkinElmer Series 200 Autosampler, thus making it an ideal choice as a LC/MS sampling accessory.

8125 Injection Valve
Part No. N9306021

7010 Rheodyne Injection Valve

The Model 7010 is a single-mode injector for the complete-filling method of loading the sample loop. You can achieve high precision without the need to read syringe calibrations carefully. You should load an excess of sample – at least two loop volumes – to flush mobile phase from the loop. The 7010 can also be used as a column-switching valve. The injector ships with a 20 mL loop attached. Pressure is set for 5000 psi and is adjustable to 7000 psi. Rotor seal is a Vespel polymer, which has an operating pH range of 0-10.

7010 Injection Valve
Part No. 02540142

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LC Supplies and Accessories

Rheodyne Injection Valves

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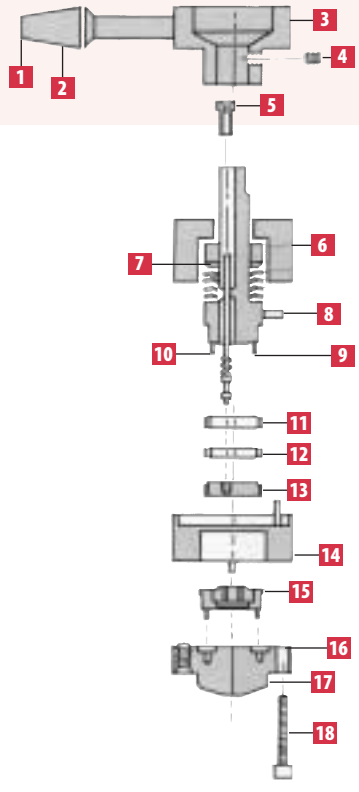
Rheodyne Valves Spare Parts

Part	Model 9725	Model 8125	Model 7010	Model 7125	Model 7725
1 Handle Screw					
2 Handle					
3 Knob Assembly					
4 Set Screws					
5 Needle Guide	**N2931054** (for S200 Autosampler) **09904800** (Manual Valve)	**N2931054** (for S200 Autosampler) **09904800** (Manual Valve)		**09904800** (Manual Valve) **02541946** (for ISS-100)	**N2931054** (for S200 Autosampler) **09904800** (Manual Valve)
6 Body					
7 Thrust Bearing					
8 Rotor Pin					
9 Seal Pins					
10 Needle Port Tube	**09904805**	**09904805**		**09904805**	**09904805**
11 Bearing Ring			**09904963**	**09904963**	
12 Isolation Seal			**09904962**	**09904962**	
13 Rotor Seal	**09904802** (Vespel) **N9302677** (Tefzel) **N9306044** (PEEK)	**10070900** (Vespel)	**09904955** (Vespel)	**09904802** (Vespel) **N9302677** (Tefzel) **N9306044** (PEEK)	**09904802** (Vespel) **N9302677** (Tefzel) **N9306044** (PEEK)
14 Stator Ring					
15 Stator Face Assembly	**N9306047** (PEEK and Ceramic)			**09904801**	**N9306047** (PEEK and Ceramic)
16 Set Screws					
17 Stator	**N9306046** (PEEK)	**10071000**	**09904953**	**09904953** (Stainless Steel) **N0911041** (Titanium)	**N9306045** (Stainless Steel)
18 Stator Screws					



Microsyringes (for Manual Injection)

Syringes are used for precise liquid delivery. Each syringe is hand-fitted to assure maximum accuracy. Our syringes are composed of glass barrels and precision stainless steel needles. The needle features a blunt tip, required for use with a Rheodyne injector.

10 µL Syringe
Part No. 09904937

25 µL Syringe
Part No. 09904823

50 µL Syringe
Part No. 09904941

100 µL Syringe
Part No. 09904822

Rheodyne 22-gauge Blunt Needle with Luer Hub
Part No. 09904943

PEEK Sample Loops for Rheodyne Valves

PEEK Sample Loops avoid many of the problems associated with stainless steel sample loops. Metal loops will often absorb sample components resulting in inaccurate quantitative results. In addition, metal loops may be corroded by high-salt buffers and chloride salts. Sample Loops are made from PEEK tubing and fittings. PEEK (Poly-Ether-Ether-Ketone) is a mechanically strong, chemically inert polymer ideal for HPLC applications where metal surfaces may interact with mobile phase or sample components.

Each Sample Loop is supplied with two PEEK hex-head nuts and ferrules. These fittings grip the tubing in two locations for a more reliable connection.

Stainless Steel Sample Loops for Rheodyne Injectors

Description	Model 7125-7010 Part No.	Model 7725 Part No.	Model 8125 Part No.
5 µL Stainless Steel Sample Loop	09904827	N9306023	20143300
10 µL Stainless Steel Sample Loop	09904938	N9306024	
20 µL Stainless Steel Sample Loop	09904939	N9306025	10082600
50 µL Stainless Steel Sample Loop	09904940	N9306026	
100 µL Stainless Steel Sample Loop	09904942	N9306027	41000013
200 µL Stainless Steel Sample Loop	09904818	N9306028	09904818
500 µL Stainless Steel Sample Loop	09904819	N9306029	
1 mL Stainless Steel Sample Loop	09904820	N9306030	
2 mL Stainless Steel Sample Loop		N9306031	
5 mL Stainless Steel Sample Loop		N9306032	

PEEK Sample Loops for Rheodyne Injectors

Description	Model 9725 Part No.
5 µL PEEK Sample Loop	N9306033
10 µL PEEK Sample Loop	N9306034
20 µL PEEK Sample Loop	N9306035
50 µL PEEK Sample Loop	N9306036
100 µL PEEK Sample Loop	N9306037
200 µL PEEK Sample Loop	N9306038
500 µL PEEK Sample Loop	N9306039
1 mL PEEK Sample Loop	N9306040
2 mL PEEK Sample Loop	N9306041
5 mL PEEK Sample Loop	N9306042

Internal Loop for Models 7725/9725

Description	Part No.
2 uL (PEEK and Ceramic)	N9306022

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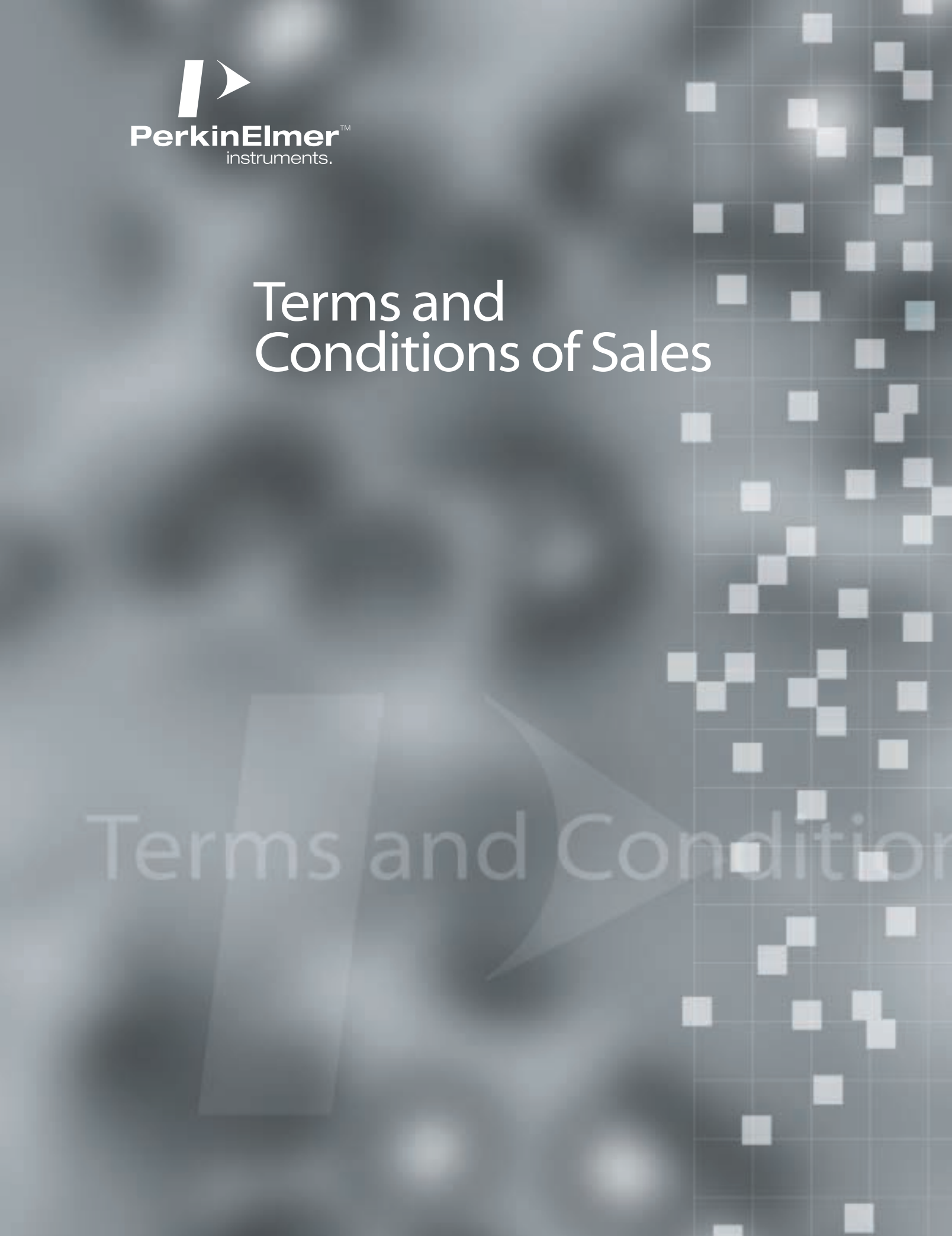
PerkinElmer™
instruments.

Terms and Conditions of Sales



Terms and Conditions of Sales

1. Delivery Dates and Prices.

a) All delivery and shipment dates indicated on the face hereof are approximate and subject to Seller's availability schedule. Seller will make reasonable efforts to meet the delivery date(s) quoted. However, Seller will not be liable for its failure to meet the quoted delivery dates or for any delay in performance hereunder due to unforeseen circumstances or shortages, due to causes beyond its control, or due to its voluntary or mandatory compliance with any governmental act, regulation, or request. If, by reason of such circumstances, Seller's supplies of the equipment or service (hereafter the "Product(s)") covered hereby are limited, Seller shall have the right to allocate the available supply among its customers in such manner as it, in its sole discretion, determines appropriate.

b) All orders are priced on the basis of an estimated shipment date within ninety (90) days of the date of order to the stated destination. Should Buyer request a change in the estimated shipment date or otherwise cause delay in delivery beyond ninety (90) days from the date of order or request that the Products be shipped outside the country of original delivery, the prices established by this quote shall no longer apply, and Seller's list prices in effect on the actual date of shipment shall be used in determining the price to be paid. Except as provided above, if the price is stated by reference to a published price list, then the price shall be the price on the published price list in effect at the time Seller receives Buyer's purchase order, without regard to the requested delivery date. However, if any Product is ordered prior to the effective date of a published price change and the delivery date is rescheduled, the price in effect at the time of the initial delivery date shall apply.

c) If Buyer requests shipment to a country other than the country originally requested, and if Seller elects not to cancel the order subject to Section 12 hereof, Seller's applicable surcharge for the actual country of delivery shall be added to the price.

d) Notwithstanding any provision to the contrary herein, all prices are subject to increase without notice to reflect changes in: (1) Federal or State laws taxing raw material or processed materials; (2) applicable laws or regulations governing working hours or compensation of labor; or (3) freight charges, insurance costs, duty or other factors affecting costs of shipment.

2. Packing and Loss or Damage in Transit.

Products will be packed for shipment in a manner suitable to the method of shipment specified by Buyer, or to the method selected by Seller in the absence of instructions. Unless otherwise indicated on the face hereof, all sales hereunder are f.o.b. shipping point, and all risk of loss or damage to equipment in transit is upon Buyer. Payment will be made in accordance with Paragraph 5 below.

3. Payment Due For Partial Deliveries.

Seller may, in its sole discretion, deliver any portion of the Products ordered, regardless of utility to Buyer in the absence of the undelivered portion, and all such partial deliveries shall be accepted and paid for in accordance with the terms of Paragraphs 4 and 5 below. Likewise, completion of any installation services shall not be a condition to Buyer's obligation to remit payment. The making of a partial delivery that, to any extent, is not in accordance with the contract of sale shall not affect the Buyer's obligation hereunder to remit payment.

4. Inspection, Acceptance and Return of Products or Trade-Ins.

Buyer shall inspect the Products immediately on their arrival and shall within five (5) days after arrival give written notice to the Seller of any claim for shortage or that the Products do not conform with the terms of the contract of sale. If the Buyer shall fail to give such notice, the Products shall be deemed accepted and to conform with the terms of the contract of sale and the Buyer shall be bound to pay for the Products in accordance with the terms of Paragraph 5 below. Return of Products, defective or otherwise, will not be accepted by Seller without notification from Buyer to Seller within 30 days of receipt of invoice and with subsequent authorization of Seller. Products authorized to be returned shall be shipped f.o.b. destination, freight prepaid. When return of nonconforming goods has been accepted by Seller, conforming shipment may be made in accordance with Paragraph 1 above and Paragraph 8 below without further liability on Seller's part. Buyer will be liable for restocking charges in the event Products are returned to the Seller which are not defective and are in accordance with these terms. When a trade-in is authorized by Seller, Buyer shall ship, f.o.b. destination, freight prepaid, the material or equipment so authorized for trade-in, to Seller's specified location.

5. Payment and Credit Terms.

Unless otherwise indicated on the face hereof, Buyer agrees to remit payment in full to the address provided on the face of Seller's invoice for all shipments, including shipments of any portion of the Products ordered, upon receipt of invoice. This obligation shall not be contingent upon the completion of any installation services included in the purchase price. No cash discounts will be granted. Account balances not paid in accordance with these terms, are subject to the maximum prevailing legal interest rate calculated from date of delinquency. In the event Seller finds it necessary to refer an account to an attorney or an agent for collection of delinquent accounts, Buyer shall pay all costs of collection including reasonable attorney's fees. Buyer agrees that Seller shall retain a security interest in the Products sold hereunder to secure any portion of the price not paid on delivery and will, on request, execute a security agreement in such form as is required by Seller, which, at Seller's option, may be filed with appropriate local, state, or other relevant authorities. Should Buyer become delinquent in the payment of any sum due hereunder, or if Buyer becomes insolvent, or if any proceedings are commenced under any bankruptcy or similar laws for Buyer's reorganization or other debt adjustment, Seller will not be obligated to continue performance. Seller reserves the right to change the credit terms provided herein when, in Seller's opinion, the financial condition or previous payment record of Buyer so warrants. If, within 30 days, Buyer fails to agree and comply with different terms of credit, and/or fails to give adequate assurance of due performance, Seller may (a) by notice to Buyer, treat such failure or refusal as a repudiation by Buyer of the portion of the purchase order not then fully performed, whereupon Seller may cancel all further deliveries and any amounts unpaid hereunder shall immediately become due and payable; (b) make shipments under reservation of a demand for advance payment or payment against tender of documents of title. Buyer's acceptance of delivery of any Products shall constitute a representation that Buyer is solvent.

6. Taxes.

Buyer is responsible for the ultimate payment of all taxes which may be assessed or levied on or on account of materials sold hereunder to the Buyer whether termed a gross receipts tax, use tax, property tax, sales tax or otherwise. Where Buyer claims that a transaction is not subject to any such tax, that Buyer is exempt, or that Seller is not required to collect such tax, Buyer agrees to provide Seller with any documentation necessary to support such a claim, to allow Seller to document its decision not to collect such tax (es), and to indemnify and hold Seller harmless from and against any and all fines, penalties, interest, taxes, and other expenses, including reasonable attorney's fees, incurred by Seller as a result of reliance upon Buyer's position.

7. Installation and Site Preparation.

Installation services are included in the purchase price of the Products sold hereunder only if expressly so stated on the face of Seller's quotation or in Seller's applicable price list. Installation services for Products transferred outside the country of original delivery by Buyer's actions may be subject to additional charges based on the actual installation site location. For Products requiring installation by Seller's service personnel, it is the responsibility of the Buyer to prepare the site environmentally and provide the required services, power, water, drain, air, bottled gases, permits,

licenses, approvals, etc., as well as whatever is required to uncrate and move the Product to its location. Failure to do so will result in a service charge by Seller to cover the lost time of its service personnel. Because Seller's service personnel may be required to enter upon Buyer's premises for the purpose of providing service to the Product sold hereunder, Buyer hereby undertakes to maintain its premises in a safe condition and to comply with all applicable laws, statutes and regulations governing workplace health and safety, and hereby accepts full responsibility for any harm, injury, or liability to Seller's personnel while on Buyer's premises, except to the extent caused solely by the negligence of Seller's personnel. Seller's sales and service personnel are not authorized to enter into any indemnity or hold harmless agreements on behalf of Seller. Seller will not, in any event, indemnify, defend or hold Buyer harmless from any liability that it may incur to Seller's sales and service personnel.

8. Limited Warranty.

a) Warranty.

i) Except as otherwise provided herein, Seller warrants to Buyer that the Products sold to Buyer are, at the time of shipment to Buyer from Seller, free from defects in material and workmanship.

ii) This warranty shall be valid for a period of 90 days from the date of shipment to Buyer, unless a different period is specified herein, or in Seller's applicable price list in which case the specified period shall apply. Notwithstanding anything to the contrary contained herein, the warranty period for data processing equipment, including data storage devices, processors, printers, terminals, communication interfaces, tape drives and all similar devices, is in all cases limited to ninety (90) days from the date of shipment to Buyer.

iii) Except in the case of an authorized distributor of Seller, authorized in writing by Seller to extend this warranty to the distributor's customers, the warranty herein applies only to Buyer as the original purchaser from Seller and may not be assigned, sold or otherwise transferred to any third party.

iv) As Buyer's sole and exclusive remedy under this warranty, Seller agrees either to repair or replace, at Seller's sole option, any part or parts of such Products which, under proper and normal conditions of use, prove(s) to be defective within the applicable warranty period. Alternately, Seller may at any time, in its sole discretion, elect to discharge its warranty obligation hereunder by accepting the return of any defective Product pursuant to the terms set forth herein and refunding the purchase price paid by Buyer.

b) Exclusions and Limitations.

i) It is recognized that some parts by their nature may not function for the warranty period applicable to the Product. Therefore, excluded from the warranty herein are chromatography columns, filaments, energy sources, lamps, power amplifier tubes, graphite tubes, sample cell holders, burner and furnace chambers, nebulizers, and other similar parts referenced in the applicable operating manual.

ii) The warranty herein excludes any equipment or accessories which are identified on applicable price lists, quotations, special promotional materials, or on the face hereof, for which this limited warranty may be further limited. Included within this category are items produced by third party manufacturers (as to which Seller passes to Buyer the warranty it has been provided by the manufacturer) and items which are sold at specially reduced prices with reduced warranty protection (in some cases, extended warranty protection may be available at an increased price).

iii) This warranty does not cover loss, damage, or defects resulting from: transportation to the Buyer's facility, improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the Product or improper site preparation or maintenance.

iv) No warranty is made with respect to used, reconstructed, refurbished or previously owned Products, which will be so marked on the face hereof and, unless otherwise indicated on the face hereof, shall be sold "As Is".

v) The warranty herein applies only to Products within the country of original delivery. Products transferred outside the country of original delivery, either by Seller at the direction of Buyer or by Buyer's actions subsequent to delivery, may be subject to additional charges prior to warranty repair or replacement of such Products based on the actual location of such Products and Seller's warranty and/or service surcharges for such location(s).

c) Place of Service.

Except when otherwise provided in Seller's current applicable price list, Seller shall use its best efforts to perform all warranty services hereunder at the Buyer's facility, as soon as reasonably practicable after notification by the Buyer of a possible defect; provided, however, that Seller reserves the right to require that the Buyer return the Product to Seller's production facility, transportation charges prepaid, when necessary to provide proper warranty service.

d) Software and Firmware Products.

The sole and exclusive warranty applicable to software and firmware products provided by Seller for use with a processor will be as follows: Seller warrants that such software and firmware will conform to Seller's program manuals current at the time of shipment to Buyer when properly installed on that processor, provided however that Seller does not warrant that the operation of the processor or software or firmware will be uninterrupted or error-free.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. SELLER EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

9. Exclusive Remedies.

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES. SELLER SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR OTHER LEGAL THEORY ARISING OUT OF THE SALE, INSTALLATION, SERVICE OR USE OF ITS PRODUCTS. SELLER NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, SERVICE OR USE OF ITS PRODUCTS.

10. Patent Indemnity.

Seller agrees to defend, at its own expense, any suit or legal proceeding which may be brought against Buyer alleging infringement by Buyer of any patent of the United States, by Buyer's use of the Product sold hereunder for its intended purposes, provided that Buyer shall give Seller prompt written notice of any claim, threat, or institution of suit or legal proceeding, and provided that Seller shall then have the sole right to control and conduct the defense and/or settlement of such claim, threat, suit or legal proceeding, either in the name of Seller or Buyer or both, and Buyer shall, at Seller's request and expense, provide relevant information and reasonable cooperation. Seller shall pay all final judgments and all costs and attorney's fees assessed against Buyer in any such suit or legal proceeding, provided Buyer has complied with the conditions hereof with respect to prompt notice and cooperation in connection with such suit or legal proceeding and given exclusive control thereof to Seller, but Seller shall not be liable for any attorney's fees or other legal expenses incurred by Buyer without the knowledge and prior written consent of Seller. Seller shall also have the right, at its own expense, to procure for Buyer the right to continue using the Product claimed to infringe, replace said Product with an equally satisfactory non-infringing Product, modify said Product so that it becomes non-infringing, or remove such Product and refund the purchase price thereof less a reasonable amount for use, damage or obsolescence.

The foregoing indemnity fully defines Seller's obligation for patent infringement; such obligations to defend and make payment shall specifically not apply to:

a) an infringement claim resulting from additions or changes in or to the Product made by Buyer or any third party or from use in combination with other equipment; or

b) an infringement claim which is settled without the consent of Seller; or

c) an infringement claim which results from compliance by Seller with specifications furnished by Buyer.

The total amount of Seller's obligation and liability under this Section shall not exceed the price paid by Buyer to Seller for the Product held to infringe, and in no event will Seller be held accountable for consequential damages under this indemnity, such as, for example, loss of business profits or goodwill. With respect to goods manufactured in whole or in part to Buyer's specifications, the Buyer will protect and indemnify Seller against all claims for damages or profits arising from infringement of patents, designs, copyrights or trademarks.

11. Modification of Terms.

BUYER'S ACCEPTANCE OF ANY QUOTATION IS EXPRESSLY SUBJECT TO BUYER'S ASSENT TO EACH AND ALL OF THE TERMS AND CONDITIONS SET FORTH IN SELLER'S QUOTATION, AND BUYER'S ASSENT TO THESE TERMS AND CONDITIONS SHALL BE CONCLUSIVELY PRESUMED FROM BUYERS SUBMISSION OF ITS PURCHASE ORDER. NO ADDITION TO OR MODIFICATION OF SAID TERMS AND CONDITIONS SHALL BE BINDING UPON SELLER UNLESS SPECIFICALLY AGREED TO BY SELLER IN WRITING. IF BUYER'S PURCHASE ORDER OR OTHER CORRESPONDENCE CONTAINS TERMS OR CONDITIONS CONTRARY TO OR IN ADDITION TO THE TERMS AND CONDITIONS CONTAINED IN SELLER'S QUOTATION, ACCEPTANCE OF ANY ORDER BY SELLER SHALL NOT BE CONSTRUED AS ASSENT TO SUCH CONTRARY OR ADDITIONAL TERMS AND CONDITIONS OR CONSTITUTE A WAIVER BY SELLER OF ANY OF THE TERMS AND CONDITIONS CONTAINED IN SELLER'S QUOTATION.

12. Authority to Export.

ALL ORDERS ACCEPTED FOR EXPORT (AND/OR RE-EXPORT) ARE SUBJECT TO: 1) UNITED STATES GOVERNMENT EXPORT REGULATIONS AND; 2) BUYER PROVIDING SELLER WITH ALL DOCUMENTATION NECESSARY FOR SHIPMENT TO THE DESTINATION COUNTRY.

13. Software Licenses and Copyrighted Material.

a) Seller provides software products by license only. The terms of the license are available from Seller and are accepted by Buyer on delivery of licensed software.

b) Unless otherwise specified, Seller's copyrighted material (software, firmware, and printed documentation) may not be copied except for archive purposes, to replace a defective copy, or for program error verification by Buyer.

14. Miscellaneous.

a) Applicable laws. This contract shall be construed in accordance with the laws of the State of New York, U.S.A. without regard to its principles of conflict of laws. Any disputes relating to the contract of sale between Buyer and Seller shall be adjudicated in the state or federal courts in the State of New York, U.S.A., and both parties hereby consent to the jurisdiction of said courts for purposes of any such litigation. The parties expressly agree to waive application of the United Nations Convention on Contracts for the International Sale of Goods.

b) Confidential Data and Information. If, in connection with the sale, purchase, use, or maintenance of the Products, Seller is requested, required, or deems it advisable to furnish data or information which it, in its sole discretion, deems proprietary, confidential, or both, Seller shall not, in any event, submit or be required to furnish such data or information unless Buyer enters into an agreement concerning the handling, use, copying, retention and return of such information, the form of which agreement is available to Buyer on request. Seller does not agree to accept any proprietary or confidential information of Buyer in the absence of such a written agreement signed by an authorized representative of Seller.

c) Assignment. Any attempt by Buyer to assign, transfer or delegate any of the rights, duties, warranties, or obligations herein shall be null and void.

d) Non-waiver. Seller's failure to exercise any of its rights shall not constitute or be deemed a waiver or forfeiture of such rights.

e) Successors. Any contract for sale incorporating Seller's terms and conditions shall be binding upon the parties thereto, their successors and permitted assigns.

f) Headings. The headings herein are for convenience only and have no substantive meaning.

g) Severability. If any provision herein is deemed unenforceable by a court of competent jurisdiction, the other provisions shall remain in full force and effect as if the unenforceable provision had not been included.

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D-6613 WP30240
Printed in the USA